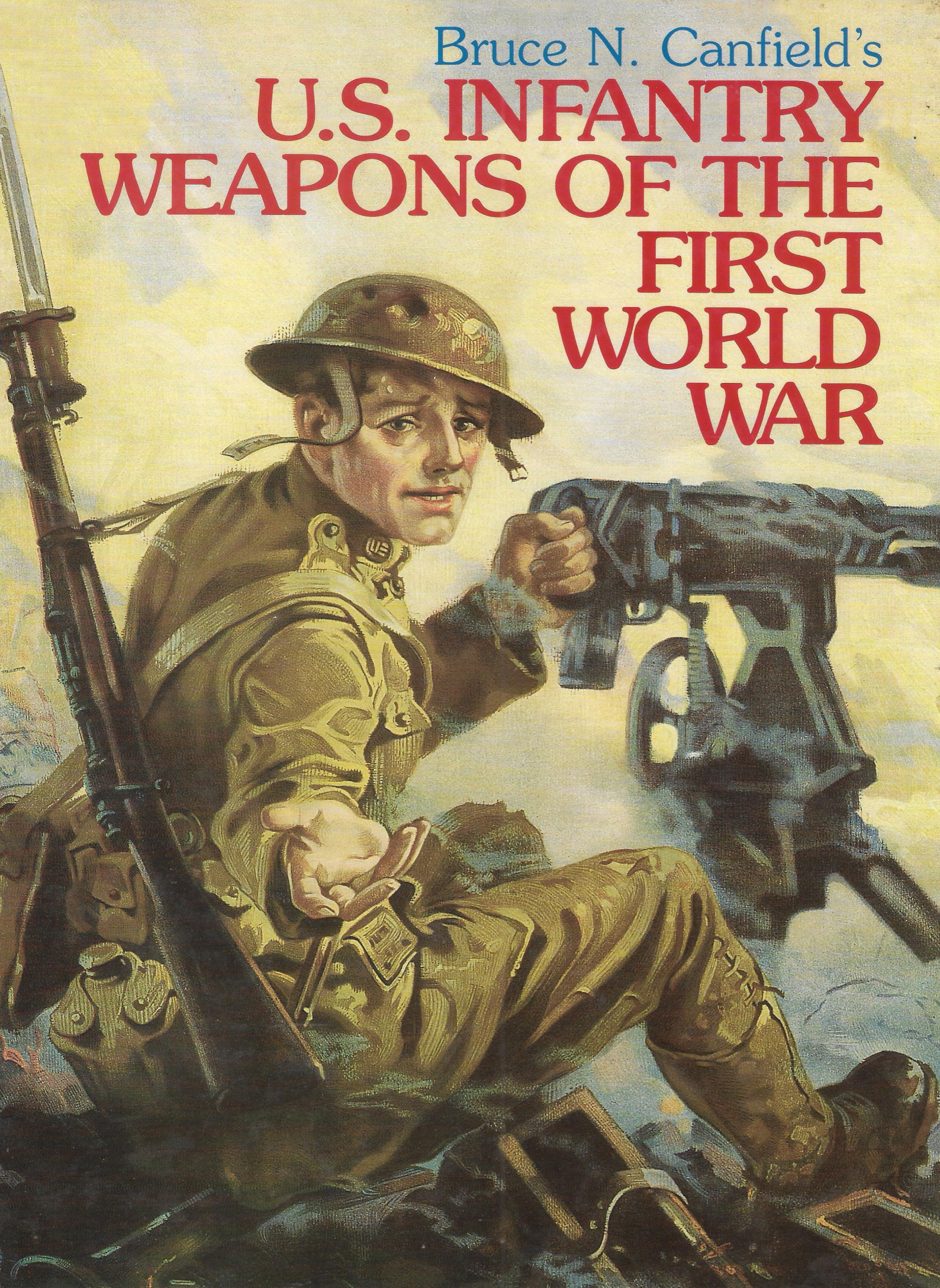
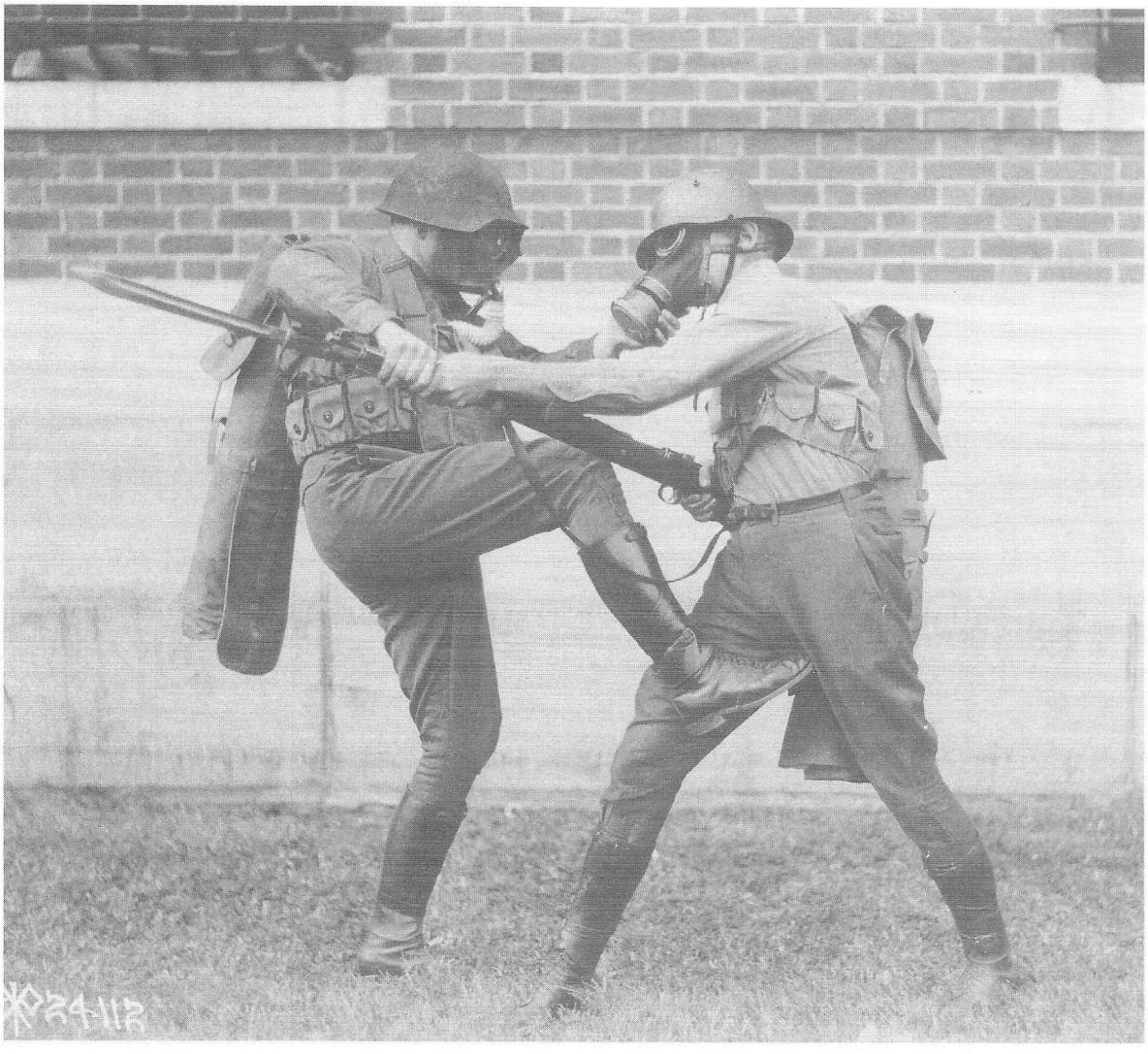
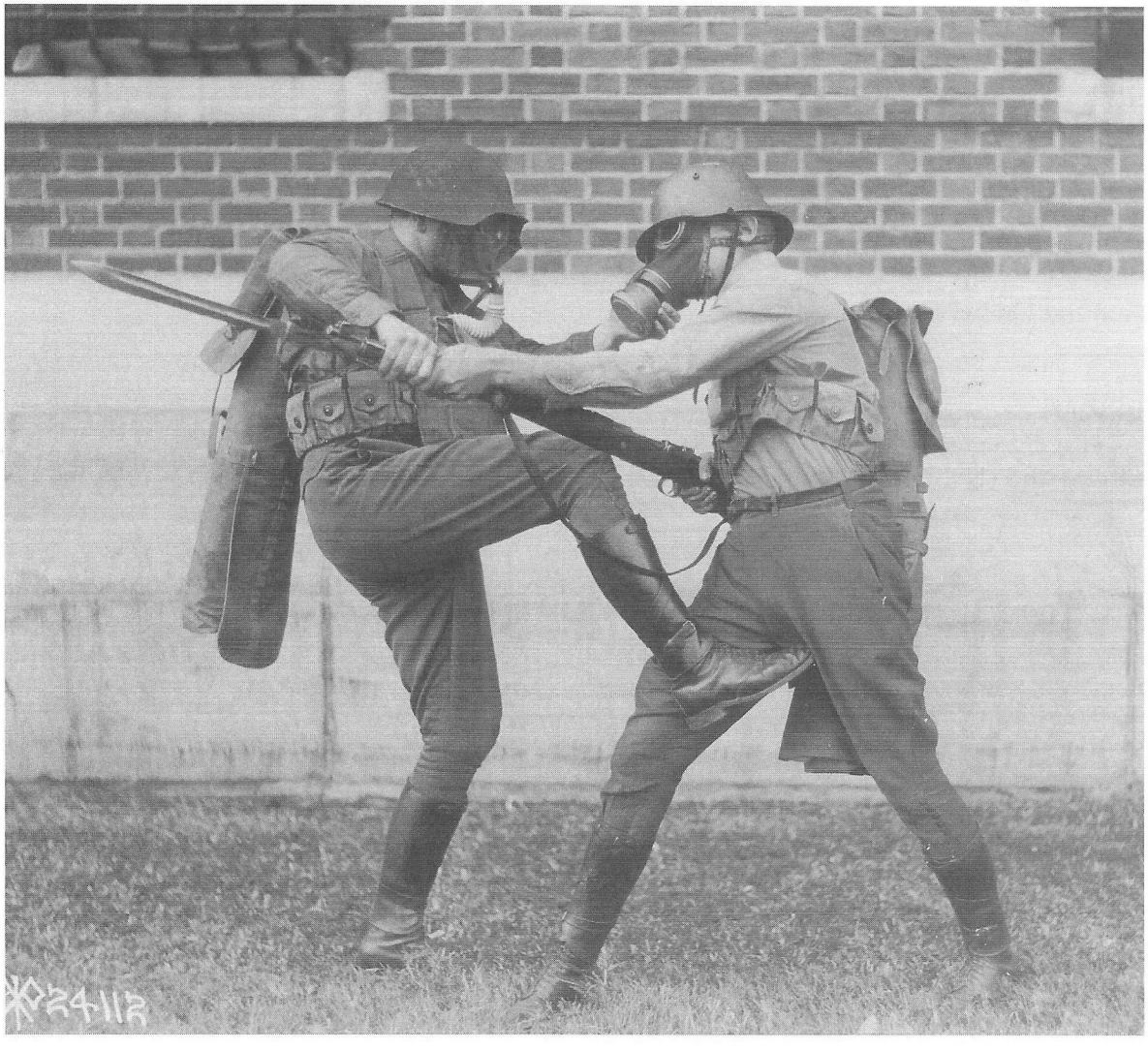
Bruce N. Canfield's

U.S. INFANTRY WEAPONS OF THE FIRST WORLD WAR





U.S. Infantry Weapons of the First World War



BRUCE N. CANFIELD

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This book was designed and set in type by Jo-Ann Langlois.
The typeface chosen was ITC Souvenir. Created in 1914 by Morris Benton, ITC Souvenir was redrawn and significantly improved in 1970 by noted type designer Ed Benguiat.

About the Cover: WWI War Bond poster depicting a Doughboy firing a M1914 Hotchkiss machine gun. A M1903 rifle with fixed M1905 bayonet is slung over his shoulder. (Robert G. Segel collection)

On the Back Cover: U.S. Marine Corps recruiting poster showing a Marine moving forward with a M1917 Lewis gun. Marines in the background are armed with rifles and bayonets. (Robert G. Segel collection)

Photo on pages 1 and 3: Two U.S. soldiers engaged in mock hand-to-hand combat — "unarmed man against man with bayonet." The individual at left, identified as Mike Gibbons, Middleweight Champion, is wearing a gas mask and an experimental U.S. helmet. The soldier at right, George Blake, is wearing a German mask and helmet and is wielding a Mauser rifle and bayonet.
(U.S. Army, courtesy of Konrad F. Schreier, Jr.)

1 2 3 4 5 6 7 8 9 10

Dedication

This book is dedicated to the memory of the "Doughboys" of the American Expeditionary Force and their sacrifice in the "War to End All Wars." While, unfortunately, the conflict did not live up to its name, the allied victory and the fate of Europe and the free world would have been in serious doubt without the selfless sacrifice of our fighting men in 1917–1918.

Acknowledgments

A book of this sort requires the efforts of a number of individuals. Special recognition goes to Konrad Schreier, Jr. who served as essentially a "technical advisor" on this project. Konnie's knowledge of the subject and his voluminous files of WWI-era ordnance documents are unparalleled. His advice and encouragement were invaluable, and I sincerely appreciate everything he did to make this book possible.

Another big thank you goes to Robert Segel for sharing the photographs of his magnificent automatic weapons collection. Robert has examples of virtually all allied automatic weapons of the First World War, and his graciousness in providing excellent photographs is very much appreciated.

Thanks also to Hayes Otoupalik, a long-time collector and dealer who has been a student of the First World War for many years. Hayes provided photos of some interesting and unique WWI artifacts that should be of interest to readers of this book.

Others who provided photographs, documentation and encouragement for this book are Daniel Whiteman (Curator, Rock Island Arsenal Museum), Frank Mallory (Springfield Research Service), Jim Enos, E.F. Furler, Jr., Donald Blake Webster, Doug Stump, Tim Staats, Dean Trimble, Mark A. Keefe, IV (Managing Editor, *American Rifleman*), Talmadge G. Rutledge (NRA Publications photographer), Mike Nischalke (Associate NRA Publications photographer), John A. Slaonaker (Chief, Historical Reference Branch, U.S. Army Military History Institute, Carlisle Barracks), Edwin Olmstead (USAMHI) and Elizabeth Holmes (Associate Registrar, Cody Firearms Museum).

I would also like to express my love and appreciation for my wife Betty and my son Andrew for their tolerance and patience while this book was being written.

Last, but by no means least, thanks to Stuart Mowbray and the entire staff of Andrew Mowbray Publishers. There is no finer group of individuals with which to work, and their expertise and professionalism are unmatched in the industry.

All items not otherwise credited are from the author's collection.

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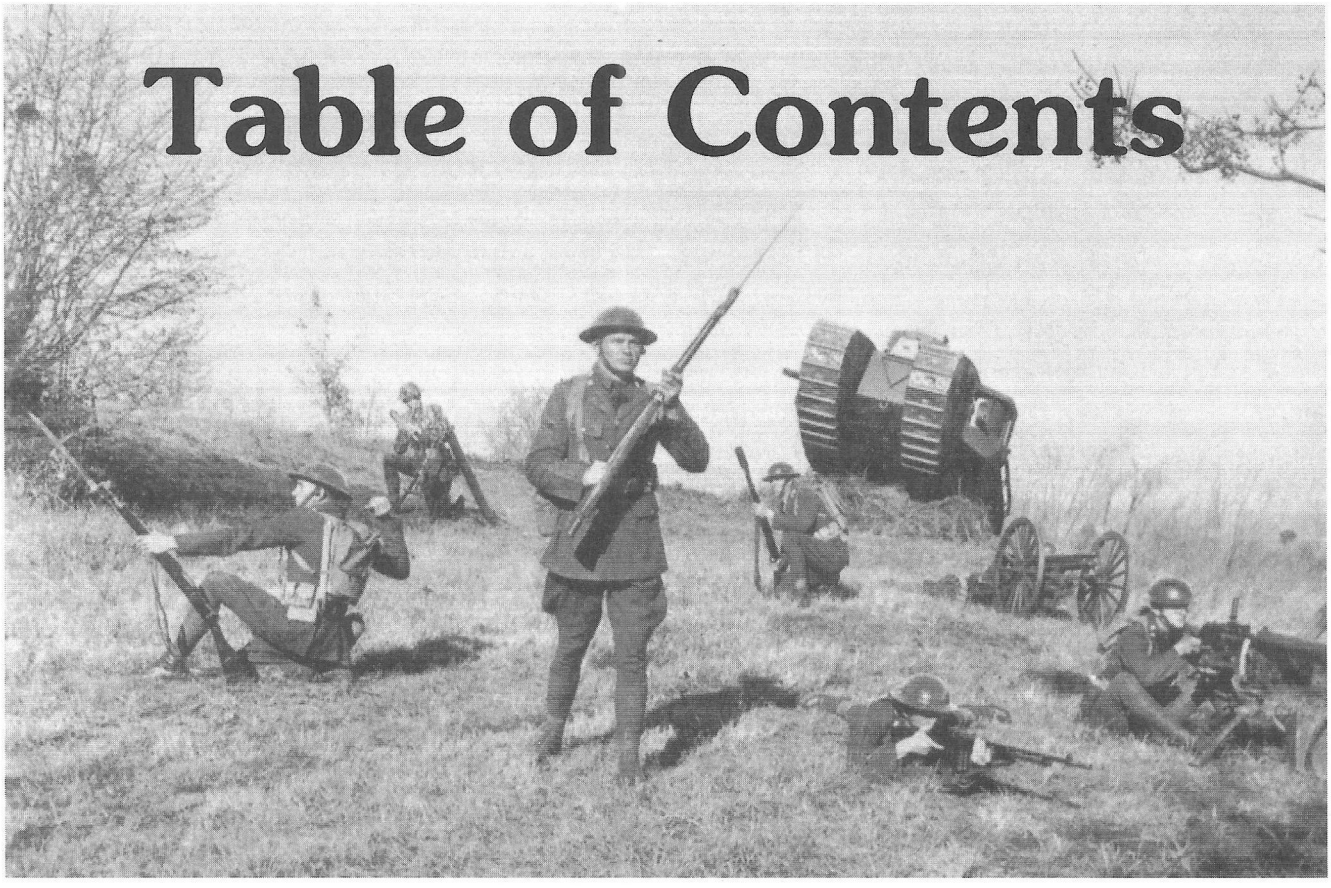

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(facing page) Group photo showing most of the U.S. WWI infantry weapons in an obviously posed setting. In addition to the tank, the photo depicts a M1903 rifle with a M1905 bayonet, a soldier throwing a hand grenade (also armed with '03 and M1905 bayonet), a Browning Automatic Rifle, a soldier launching a rifle grenade from a V-B launcher attached to M1903 rifle, a Browning M1917 machine gun, a 3" Stokes trench mortar and a M1916 37mm gun on a wheeled carriage. (U.S. Army, courtesy of Konrad F. Schreier, Jr.)

Author's Preface

The phrase "First World War" often conjures up images of old newsreels depicting Doughboys clad in woolen uniforms with puttees and soup bowl helmets marching off to France past cheering throngs. Other images may be the utter desolation of "no man's land" or the unnecessary slaughter of hundreds of thousands, on both sides, in protracted and brutal trench warfare. However, compared to the Second World War which is still a vivid, if fading, memory to many veterans today, World War I has receded into the mists of history. Precious few veterans of the "War to End all Wars" are still around today, and their thin ranks are almost gone. To most Americans today, the First World War is almost ancient history and has been overshadowed, in the eyes of many, by the overwhelming magnitude of the Second World War. However, World War I was a pivotal time in our nation's history and marked the ascendance of the United States into a world power. The conflict also sowed the seeds of the Second World War.

There are many parallels between World Wars I and II regarding the United States' involvement. Prior to America's entry into both wars, there was strong isolationist sentiment in the country, and our military was ill-prepared to fight a modern war overseas. However, once war was declared, the nation rallied around our armed forces and no effort or expense was spared in defeating the enemy. The industrial might of the United States proved to be an awesome force and staggering quantities of war material eventually flowed from our factories. At the conclusion of both wars, the United States military was unquestionably the strongest and best-equipped fighting force on the face of the earth.

Despite these striking similarities, there were some differences between the First and Second World Wars. At the beginning of WWI, the United States was woefully short of modern weaponry. This shortage was initially addressed with the acquisition of all sorts of weapons from our allies, chiefly the French. The weapons acquired ranged from grenades and automatic rifles to artillery pieces and aircraft. This situation is aptly, if humorously, illustrated by a passage from Laurence Stalling's excellent book *The Doughboys*:

America had entered the war as the rich boy who had strayed across the tracks, got mixed up in a gang war, and had to buy his slingshot and zip gun from his more experienced pals.

Even though modern weapons of American design and manufacture were coming "on line" in mid- to late-1918, there were still a great many weapons in the hands of our troops that were procured from our allies at the time of the Armistice. This situation was in direct contrast to World War II, when virtually all of the weapons used by the American military were designed and produced in the United States. In addition, America provided vast amounts of war material to our allies during WWII.

As we discuss the varied and sundry weapons used by the United States infantry during the 1917–1918 period, many items produced by our allies will be covered. In addition, some allied weapon designs were adopted by the United States and put into production in this country as well. The composition and organization of the American Expeditionary Force (AEF) varied during the course of the United States' involvement in the war. The infantry weapons issued to the AEF also evolved throughout the war. Konrad Schreier, Jr. clarifies this potentially confusing situation by outlining the three phases of AEF small arms during WWI:

Phase 1: Up to May 1918, the first 12 divisions were initially equipped with 8mm French Hotchkiss machine guns, 8mm Chauchat automatic rifles and U.S. M1903 Springfield rifles.

Phase 2: The next 11 divisions sent in May and June of 1918 were equipped with U.S. M1915 Vickers machine guns, French 8mm Chauchat automatic rifles and either the U.S. M1903 Springfield or M1917 Enfield rifles.

Phase 3: All divisions sent to France from July 1918 on were equipped with U.S. .30 caliber M1917 Browning machine guns, .30 caliber Browning Automatic rifles and either U.S. M1903 Springfield or M1917 Enfield rifles.

Beginning in about August of 1918 many of the first 23 divisions, or elements of them, were being re-equipped as those sent after July had been.

There was some overlap between and among these three phases, but they give some indication how the infantry weapons issued to the Doughboys of the AEF varied as the war progressed. Some of our troops were carrying the latest in U.S. weaponry when they arrived in France, and others still retained many of the older French, British and American arms at the time of the Armistice.

In addition to the machine guns, automatic rifles and service rifles outlined above, the troops of the AEF fought with many other types of infantry weapons such as trench mortars and 37mm guns. Since the term "infantry weapons" can be very broad, some

parameters were necessary to determine which weapons should be profiled in this book. Certainly the "traditional" small arms such as rifles and pistols must be included, but where should the line be drawn? Tanks and artillery pieces can be construed as "infantry weapons" if one is so inclined. However, including weapons of this type would make the book too broad and not allow the focus to be on the weapons employed by the average "Doughboy." Therefore, I have elected to use essentially the same criteria for selecting the weapons to be included in the book as used for my book *U.S. Infantry Weapons of World War II.* As stated in that book, "...the determining characteristic was not diameter of bore but portability — whether the weapon could be carried into combat by infantry troops and could be fired by the hand, shoulder or light support." This is the yardstick by which the weapons were selected for this book as well.

In addition to defining the term "infantry weapons," I was faced with deciding whether or not some experimental and prototype weapons should be included in this book. All of the weapons in my World War II infantry weapons book saw actual combat use in varying degrees. However, there were a number of weapons developed during the First World War that saw little or no combat use, since the war ended before they could be manufactured or fielded in quantity. In the interest of presenting a total picture of America's efforts to produce "state-of-the-art" infantry weaponry during the 1917–1918 period, some weapons will be profiled that were not issued in quantity, if issued at all, to our troops. If the war had lasted another six months, most of these weapons would have been employed in action. Even though they may not have been part of the typical Doughboy's arsenal, such weapons are, nevertheless, historically significant and quite interesting military artifacts of the First World War period and worthy of inclusion in this book.

As anyone with even a casual knowledge of the First World War knows, gas warfare was employed by all sides during the conflict. However, with the exception of some chemical grenades and trench mortar shells, the toxic gas was dispensed via artillery shells or large gas projecting mechanisms. These fall outside the scope of weapons to be covered by this book, and only cursory mention of gas warfare will be found in the pages that follow. This is not intended to slight the historical aspects of gas warfare during WWI but, rather, a reflection on the parameters necessary to have a focused work.

Another consideration regarding what specific weapons should be profiled was the fact that a number of black Americans were incorporated into French infantry units during the war. Most were issued U.S. Army uniforms but were generally equipped with French accouterments and weaponry. The French weapons that were not standardized by the American military and not widely issued to the AEF will be briefly mentioned but will not be covered in depth. Again, this decision is based on the desire to have the main focus of the book on the weapons that were actually issued to, or designed for, the American Doughboy in U.S. infantry units.

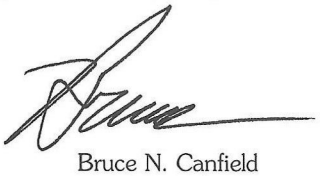
As a footnote, some may wonder as to the derivation of the term "Doughboy." Although some theories place the term as predating the American Civil War, the most credible and most widely accepted theory is related in *The Doughboys*:

The raw American recruits who were rushed to Europe were called the Doughboys. There can be little dispute as to the derivation of the name. In Texas, U.S. Infantry along the Rio Grande were powdered white with the dust of adobe soil, and hence were called "adobes" by mounted troops. It was a short step to "dobies" and then, by metathesis, the word was Doughboys.

The term Doughboy to describe a U.S. infantryman remained in use into the early part of the Second World War, when it was generally replaced by "GI" (Government Issue). The term Doughboy is now used almost exclusively to refer to American soldiers of the First World War. It should also be mentioned that a contingent of U.S. Marines served in the AEF and gained an enviable reputation. For the sake of simplicity, the term "Doughboy" or "soldier" as used in this book may also refer to the Marines of the AEF in some cases, although this appellation is not normally applied to them.

Another feature that this book has in common with its World War II counterpart is the inclusion of "Collector Notes" at the end of each chapter. This feature proved to be popular with readers of that book, and I think it may be of interest to many readers of this book as well. As can be seen, more collector-oriented material will be presented on some weapons than on others. This is due to the availability of specimens on the market today and general collector interest. Other books such as my *Collector's Guide to the '03 Springfield* and *Collector's Guide to U.S. Combat Shotguns* give detailed information on many of these weapons. Persons wishing to explore such topics in greater detail may wish to acquire these and other collector-oriented books listed in the bibliography. It should be mentioned that some of the weapons profiled in the pages that follow are classified as machine guns or "Destructive Devices" and are subject to stringent federal (and in some cases municipal or state) regulations. The various "Collector Notes" will detail which weapons fall into this category.

Some of the weapons examined in this book remained in the United States' military inventory for many years after the Armistice and others saw little or no use after 1918. All played a role in securing the Allied victory against the forces of oppression. As the 20th century draws to a close, the First World War will recede further into the annals of history. The sacrifices of the members of the American Expeditionary Force during the war should not be forgotten. Hopefully, this book will help preserve the story of these brave Americans as well as the fascinating and historically significant infantry weapons utilized by them.



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1999

Introduction

Although World War I memories have grown dim, when I was a kid in the 1930s the "Great War" was fresh in America's mind. While they are all gone today, everybody knew people who had been in it. Many members of my family, their friends and our neighbors had served in it. They would talk about it and, with World War II obviously coming, their stories fascinated me.

In the 1930s, the annual Armistice Day (now Veteran's Day) was a celebration, led by the American Legion, of remembrance of the U.S. Army's participation in WWI. The American Legion was founded by men who had served in World War I, and many turned out in the uniforms they had worn in the war. There were also contingents of troops on parade. It really got your attention.

Back then, another annual event was Army Day (now Armed Forces Day) when U.S. Army posts, camps and stations held open house. These included displays and demonstrations of weapons, most of which had been used in World War I. I vividly recall being allowed, under close and careful supervision, to fire a shot or so from an '03 Springfield rifle and even a burst of a few rounds from a cal. .30 M1917 Browning water-cooled machine gun. This started my interest in U.S. Army World War I infantry weapons that has been ongoing ever since.

By the time I joined the U.S. Army Reserve Officers Training Corps (R.O.T.C.) in late 1942, World War I was becoming ancient history. The U.S. Army had been completely reorganized, and even the World War I infantry drill had been superseded. Although we trained with them, World War I infantry weapons and equipment were obsolescent. However, practically all of our officers and non-coms had served in World War I. Of course, they told us stories of their war, including how they employed the various weapons.

After I returned from overseas service in World War II, my association with the U.S. Army continued. It led to my attending the U.S. Army Ordnance School at Aberdeen Proving Ground. By then, the U.S. Army's World War I infantry weapons were all obsolete museum pieces. However, the Aberdeen Ordnance Museum had examples of practically all of them.

While at the Ordnance School, we were encouraged to look over the Ordnance Museum Collection, and I was fortunate to befriend its curator, the late Col. George B. Jarrett. He was very interested in World War I weapons, and I was allowed to closely examine and even fire many of them. This really increased my interest in the U.S. Army World War I infantry weapons and equipment, and I quickly found out much about them had been forgotten. I began acquiring books, manuals and other publications about the weapons and their actual use during the war. I soon found that the publications were often very hard to come by, and many of them contained incomplete information. Even the U.S. Army archival sources were missing many important manuals and publications. This was particularly true of the French and British weapons that the U.S. Army had used, including the publications pertaining to them published by or for the U.S. Army in France and England.

The reason for the scarcity of publications was largely due to the fact that the U.S. Army's participation in World War I was so short. The first U.S. Army infantry arrived in France with only their rifles and a few obsolescent machine guns. When they went into combat in the fall of 1917, they used automatic rifles and machine guns supplied by the French.

As ever-increasing numbers of U.S. Army troops arrived in France in 1918, they brought some U.S. infantry weapons with them, but continued to use weapons supplied by the French and British. With a few notable exceptions like the French 37-mm Model 1916 gun and the British 3" Stokes mortar, none of these French or British weapons were ever used by the U.S. Army after the end of World War I.

This all happened in some eighteen months, and then the U.S. Army demobilized very quickly. Not only did the French and British weapons disappear, but so did most of the manuals and other publications relating to them. The U.S. Army standardized only American-made weapons such as the Browning Automatic Rifle and the Browning Machine Gun and others developed from French and British weapons (such as the 37-mm gun and the 3" Stokes mortar).

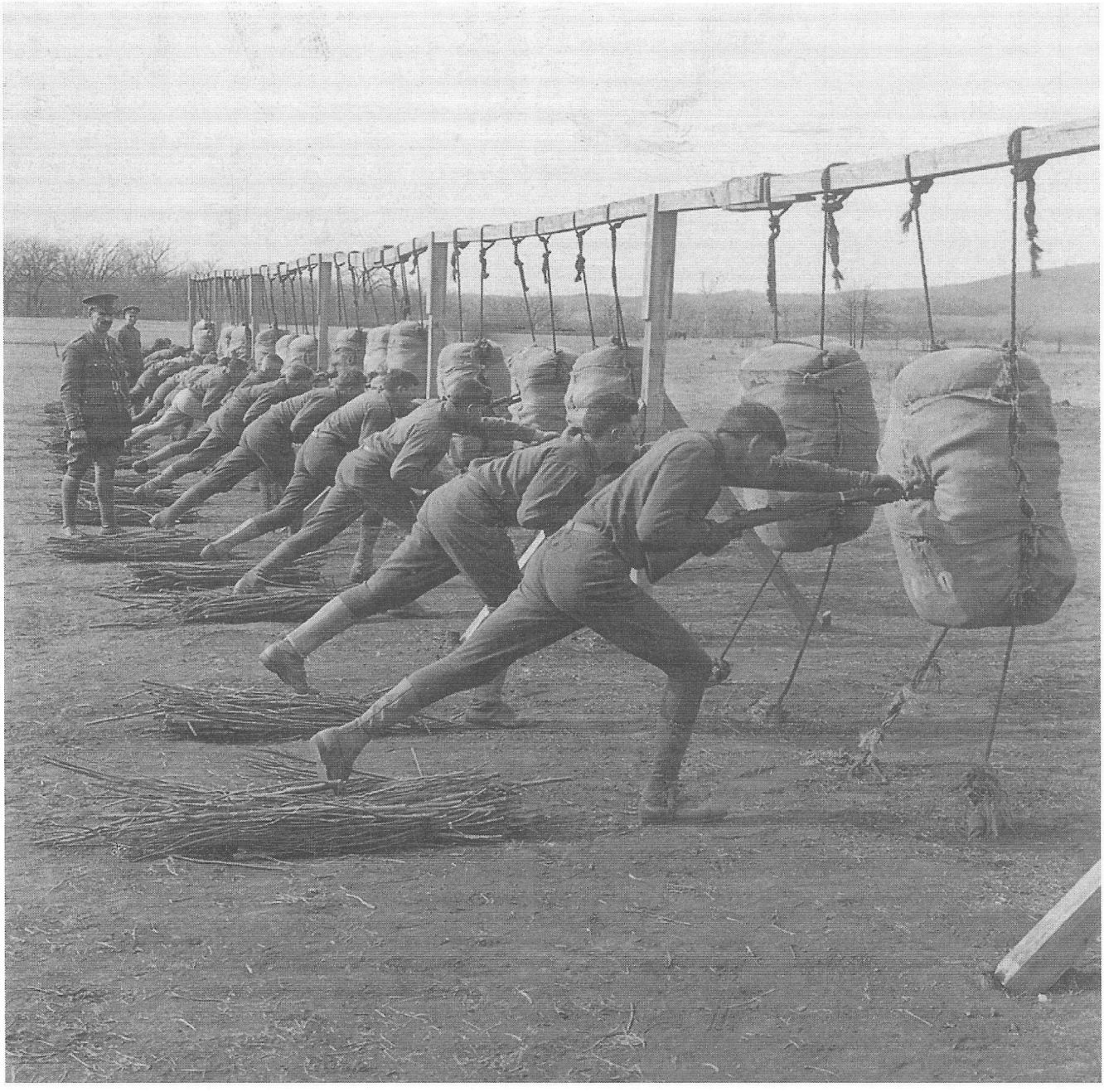
The U.S. Army published a preliminary ordnance manual on its World War I weapons just after the war ended, but it was incomplete and no revised edition was ever printed. Between 1919 and 1922, the U.S. Army published a series of historical reports on its World War I weapons and associated equipment for the use of its officers. Unfortunately, while they are detailed and quite comprehensive, the editions were printed in very small numbers, and today they are practically impossible to find. All this makes collecting the information needed to write a book on World War I U.S. infantry weapons very difficult.

When Bruce Canfield mentioned that he was interested in writing a book on the subject similar to his book on U.S. World War

II infantry weapons, the idea really fascinated me. Bruce's collector's point of view is perfect for the subject, and his ability to describe things in as much detail as is required suits the subject. Therefore, I encouraged him to pursue the idea and agreed to help him with the research for it.

This book is the result. It will help everyone from museum curators to private collectors with collections containing obscure World War I U.S. infantry weapons and associated equipment to sort out the information and history of the weapons and to eliminate the mis-information about them.

Konrad F. Schreier, Jr.
August 1998



To take a raw civilian straight from the office, shop or farm and make him into a thorough-going fighting man in the period of three months was a task that required aid of the best kind. Our country, therefore, called on Great Britain to send us hundreds of instructors who knew how the "game was played" on the western front and who could instruct our men how best to defeat the Germans and how best to protect themselves in battle. Great Britain sent us the kind of help that we needed, men like that captain that you see standing behind the line of men. He is experienced in all the tricks of hand-to-hand fighting as is his assistant, a non-commissioned officer that is farther down the line. To give the men training as realistic as possible, dummies such as those that you see were strung along in rows, one for each man. With those and his rifle with its bayonet, the soldier learned the technique of killing; how to thrust, parry and club, and how to keep his footing on the treacheorus ground, made as real as possible with bundles of brush. It is skill in bayonet fighting that counts as much as strength, but strong backs and strong arms are essential to make this vicious "short point stab" count. (Stuart C. Mowbray collection)

Edged Weapons

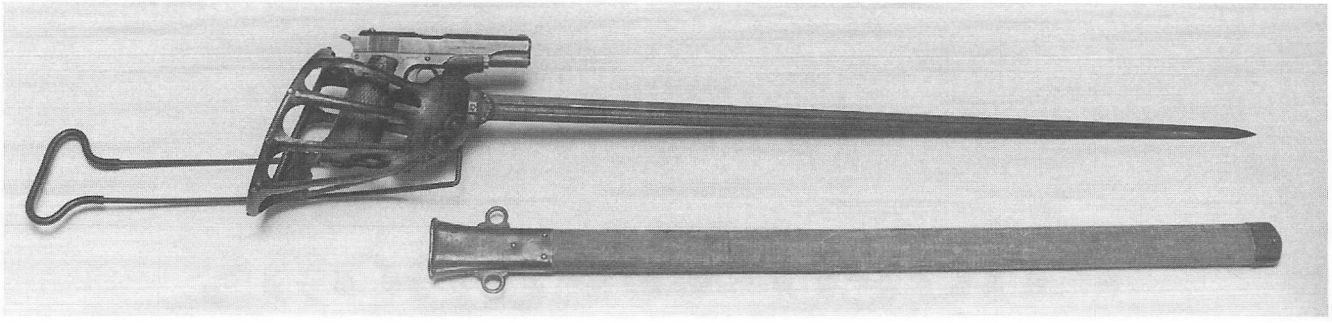
The use of edged weapons for warfare in the 20th century may seem anachronistic to some people. Bayonets and knives may be thought of as useless objects when compared to machine guns and mortars. This perception, however, is quite erroneous. While edged weapons ceased to be primary armament with the advent of firearms, they nevertheless continued to be useful auxiliary weapons and tools for the modern infantryman. The trench warfare that characterized much of the Western Front during the First World War proved to be a fertile environment for the utilization of numerous types of edged weapons. Such arms were often wielded in brutal close-quarter combat encounters that were all too frequent in trench fighting. In fact, the term "trench knife," which is still used today, has its origins in WWI. Some self-styled pundits derided the bayonet as a hopelessly obsolete weapon after the conclusion of the American Civil War. However, the First World War proved such "experts" wrong, as bayonet fighting was quite common between the antagonists. Following the war, General John J. Pershing stated in his memoirs:

My view was that the rifle and bayonet still remained the essential weapons of the infantry...

Virtually every Doughboy carried some type of edged weapon; either a bayonet, bolo or trench knife, if not all three. Many were used for mundane chores such as opening ration tins or clearing brush. Laurence Stallings related that some infantrymen believed that "...bayonets were for broiling stolen chickens." At times, however, they were used in deadly earnest hand-to-hand combat. In certain situations, a bayonet, bolo or trench knife could literally mean the difference between life and death to a Doughboy. The use of edged weapons by the American military probably reached a zenith during the First World War. While U.S. infantrymen in the Second World War (and later) continued to be issued bayonets and knives, the opportunity to utilize them in combat situations was greater in World War I than any subsequent conflict.

Edged weapons were an indispensable part of the Doughboy's arsenal, and many interesting types were procured and issued in large numbers. These included several types of bayonets, knives with steel knuckle-bows or brass knuckle handles and heavy-bladed bolos. Some rather bizarre designs were also considered. One of the more interesting of these was a weapon that was reportedly fabricated at Springfield Armory which consisted of a M1913 saber blade brazed to a handle containing a M1911 .45 pistol and a sliding shoulder stock! The designers of this cumbersome arm apparently got a bit carried away with the idea of producing a combination sword and pistol weapon. This weapon was only made in extremely limited prototype numbers

Close-up view of handle area containing a standard M1911 .45 pistol. (Hayes Otoupalik collection)



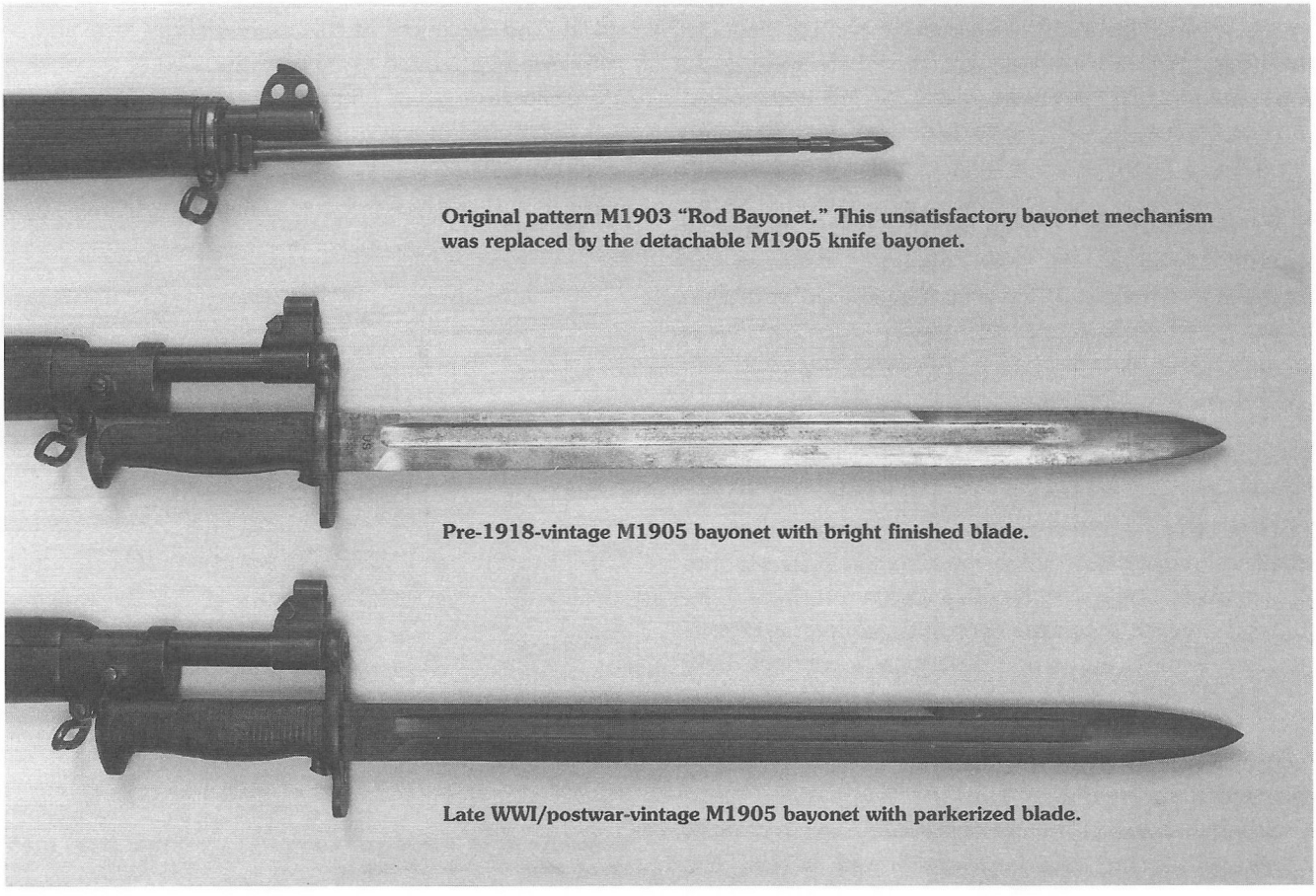
Experimental combination sword and pistol weapon made from a M1913 saber blade with a handle containing a M1911 .45 pistol and a sliding shoulder stock. This unusual, one-of-a-kind prototype weapon was carried in a M1913 saber scabbard, shown. (Hayes Otoupalik collection)

(possibly only a single example was fabricated) and none are known to have been field tested or issued. It must take the prize as the most unusual arm of its type considered for use by the United States military during WWI (or any other time). Even though this weapon was not (mercifully!) adopted, extremely large numbers of other more conventional edged weapons were manufactured and issued in quantity to the Doughboys.

Bayonets

The first type of edged weapon we will discuss is the bayonet. The bayonet was issued in greater numbers and saw wider combat use than any other variety of edged weapon during WWI. Every Doughboy who was issued a rifle was also issued a bayonet.

Due to the cumbersome nature of early firearms, bayonets were a very important adjunct. Bayonets could transform an unloaded and temporarily useless musket into an efficient pike-type weapon. The advent of breechloading repeating rifles supposedly spelled



Original pattern M1903 "Rod Bayonet." This unsatisfactory bayonet mechanism was replaced by the detachable M1905 knife bayonet.

Pre-1918-vintage M1905 bayonet with bright finished blade.

Late WWI/postwar-vintage M1905 bayonet with parkerized blade.

the end of bayonets, and many military theorists perceived that they would no longer be needed. However, military forces around the world continued to issue bayonets, and they proved to be of value in the mass infantry assaults common to the Western Front during much of the First World War. Basic infantry training in the First World War period placed a great deal of emphasis on bayonet fighting techniques. This is summed up in a WWI-vintage U.S. Army training manual prepared by the Chief of Infantry:

THE BAYONET — The bayonet is an essential addition to the rifle. An enemy cannot be shot out of entrenchments, but must be driven out by personal contact or the threat thereof. A knowledge of the use of the bayonet lends great moral assistance to the advance to close quarters. But the mere possession of a bayonet, without the ability to use it, is of no value. The lack of spirit to seek personal combat is also a serious handicap. Therefore, the infantryman must be trained to have confidence in his bayonet and to have a desire to use it.

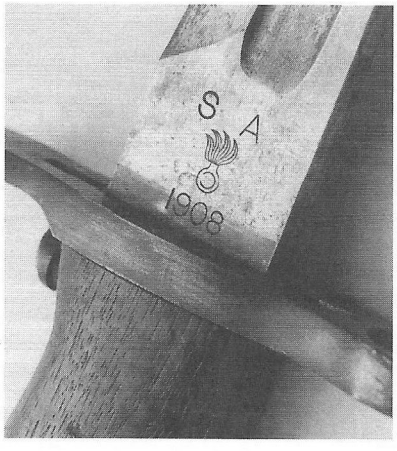
The Ordnance Department publication *History of Trench Warfare Material* stated the following regarding bayonets:

For close work, the attachment of the bayonet (upon the rifle) renders it an instrument of terror and of deadly effect.

M1905 Bayonet

In 1903, the United States adopted the famed U.S. Rifle, Caliber .30, Model of 1903. The '03 quickly established itself as one of the best service rifles of its type ever produced. The original design featured an ineffective sliding rod bayonet, and in 1905 a knife bayonet was adopted to replace it. The new bayonet was standardized as the "Model of 1905." The M1905 had an overall length of 20" with a 16" blade. The bayonet was fitted with walnut grips. The bayonet attached to a lug on the bottom of the rifle's front band. A push-button locking plunger secured the bayonet to the rifle and allowed it to be easily removed.

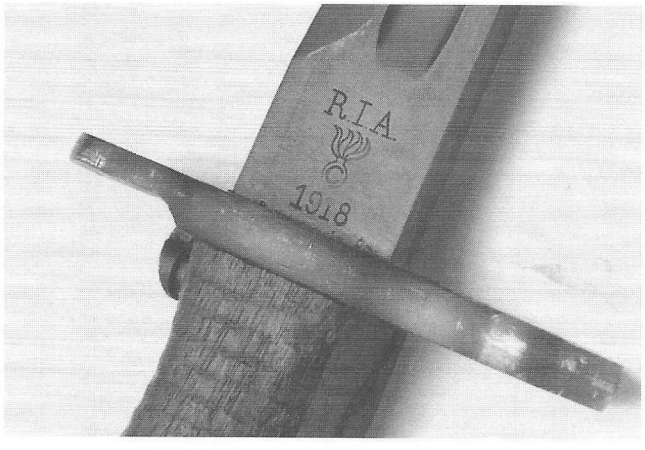
The M1905 bayonet was manufactured by Springfield Armory and Rock Island Arsenal, the same entities that produced the M1903 rifle. The initials of the manufacturer ("SA" or "RIA"), an ordnance "flaming bomb" insignia and the date of production were stamped on the reverse ricasso. The obverse was marked with a serial number and "U.S." Prior to 1907, the bayonets were not serially numbered. There was never any intention to issue bayonets and rifles with

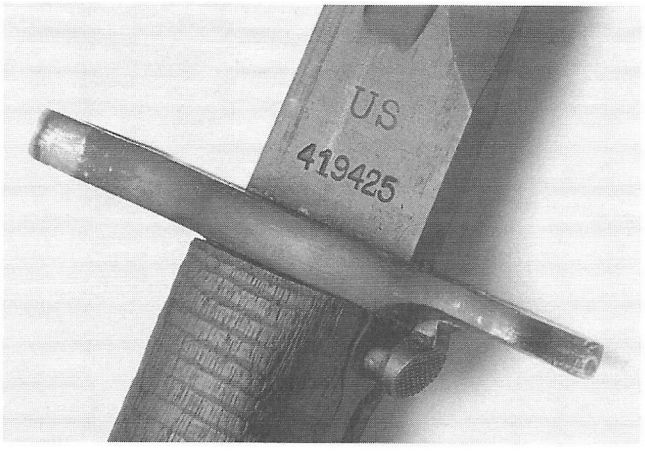


(left) Blade markings on M1905 bayonet manufactured by Springfield Armory in 1908.

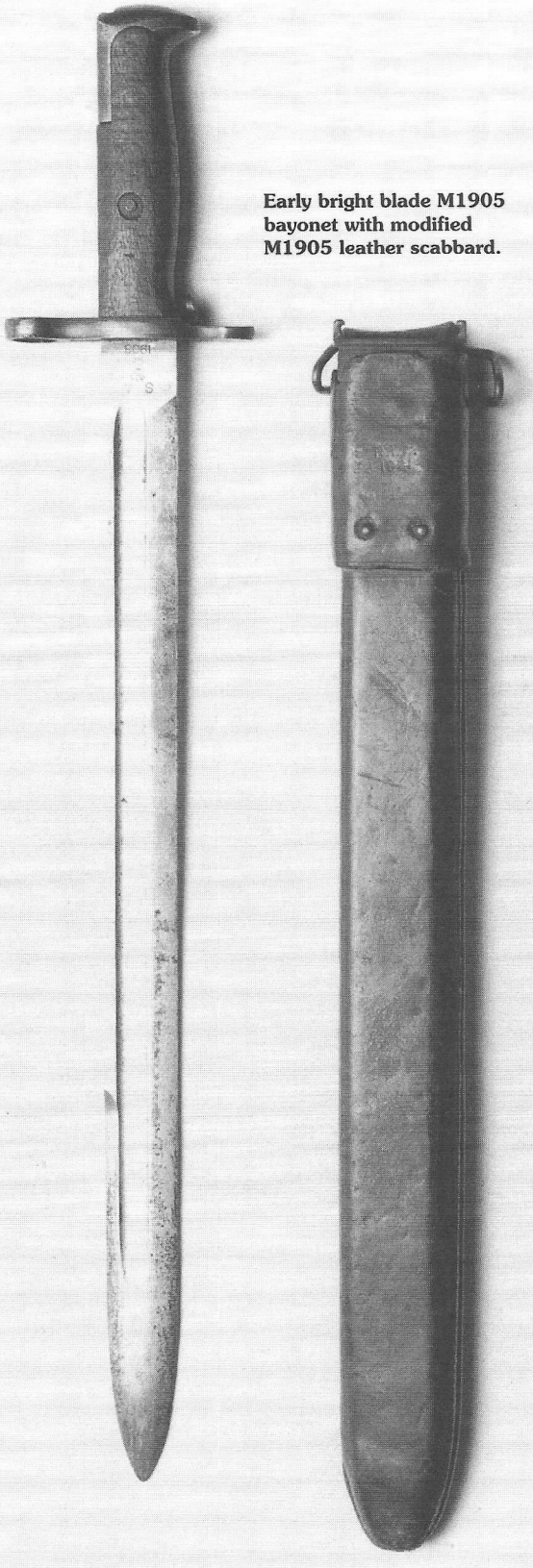
(right) Typical blade markings on M1905 bayonet. This example was made by Rock Island Arsenal in 1918.

(below, right) Typical blade markings. Note the "US" and serial number. The locking plunger can be seen in this view.

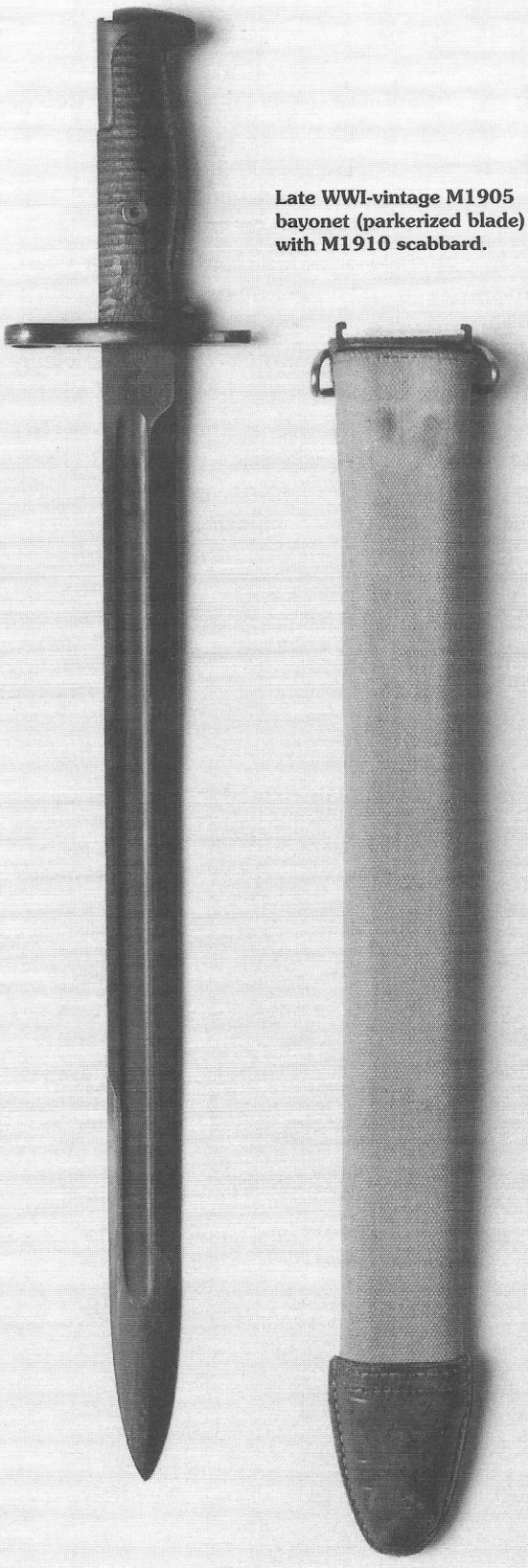




U.S. soldiers firing their M1903 rifles with attached M1905 bayonets from a trench position during WWI. (National Archives)



Early bright blade M1905 bayonet with modified M1905 leather scabbard.



Late WWI-vintage M1905 bayonet (parkerized blade) with M1910 scabbard.

matching serial numbers. This would have served no purpose and would have been a logistical nightmare. The reason for serially numbering the bayonets was that they were considered important items of issue, and this allowed them to be accounted for more efficiently.

From the start of production, until at least 1917, the M1905 bayonet blades were bright. The portion of the bayonet under the grips and about ¼ inch beyond was blued to reduce corrosion in this area. Sometime in 1917, Springfield Armory, and possibly Rock Island Arsenal as well, began bluing the formerly bright blades. This procedure lasted less than a year, and by the latter part of 1918, parkerizing was instituted to replace the bluing process. A WWI-era Ordnance Department report stated that, "Many M1905 bayonets were blued in France using an Italian process." In addition to this unknown quantity of bright blades blued in France during the war, thousands of earlier M1905 bayonets were subsequently parkerized during the extensive overhaul programs carried out in the 1920s and later.

The M1905 bayonet was initially issued with the M1905 scabbard. This scabbard was constructed of a wooden body covered by rawhide with a smooth leather cover sewn in place. A metal belt hanger, similar to the type used with the later Krag bayonet scabbard, was fitted. In 1910, the U.S. military adopted a different method of attachment for bayonet scabbards and other equipment such as canteens, pistol holsters and first aid pouches. The attachment consisted of bent wire hooks that could be attached to the new pattern cartridge belt and pistol belt. Upon adoption of the new belt attachment system, the M1905 bayonet scabbard was superseded by the M1910 scabbard. This later pattern scabbard consisted of a wooden body with a rawhide covering and a khaki canvas cover sewn in place. The scabbard had a leather tip. Fairly large numbers of the earlier M1905 scabbards were modified by the addition of cartridge belt hooks. The modified M1905 scabbards were classified as "Substitute Standard" and were issued concurrently with the new pattern M1910 scabbard.

The M1905 bayonet was a very serviceable design and saw widespread issue to the troops of the AEF during WWI. Very few complaints were leveled against the M1905 bayonet, and it was equal or superior to any other type of bayonet fielded by our allies or adversaries.

Virtually all of the M1905 bayonets that saw actual front-line service during the war were of the bright-blade variety, as few, if any, parkerized bayonets made it to France prior to the Armistice. It is possible that some of the bayonets with blued blades saw use, but

(above) Doughboy sharpening his M1905 bayonet on a grinding wheel. Note the M1905 bayonet stuck into the table at the right of the wheel. (U.S. Army Military History Institute)

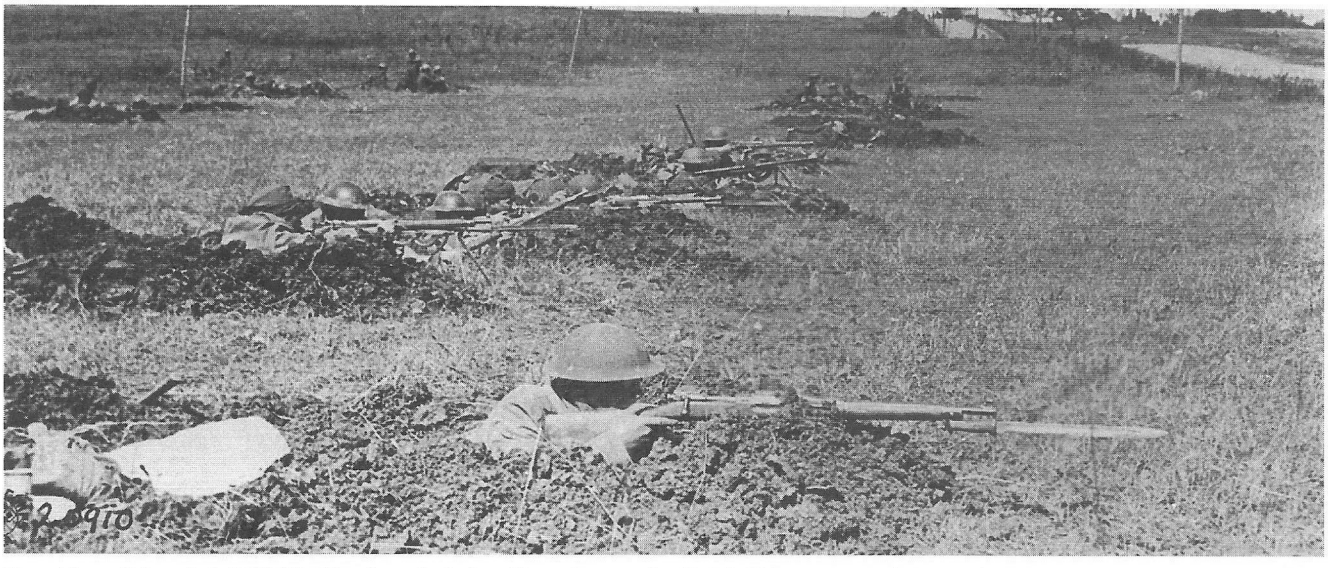
(right) Note the M1905 bayonet in a M1910 scabbard attached to the pack of the soldier. (National Archives)

these were not produced in extremely large numbers.

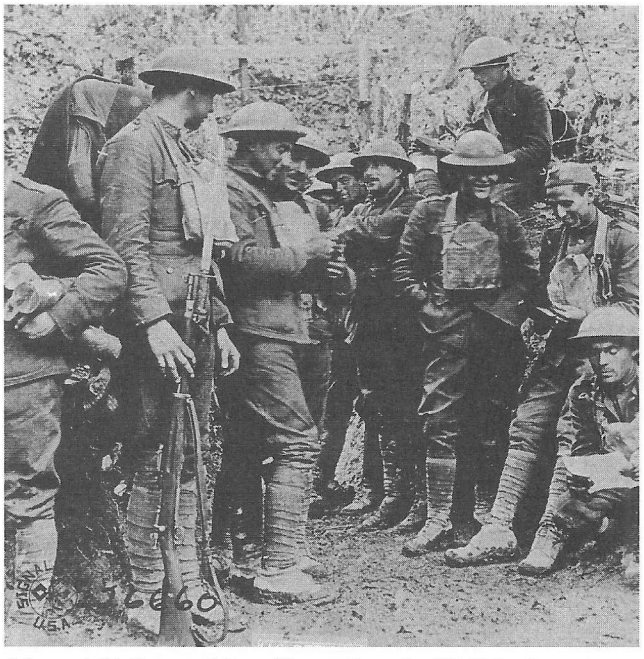
In addition to the bayonets produced prior to 1917, some 347,533 M1905 bayonets were manufactured by Springfield Armory and 36,800 by Rock Island Arsenal during World War I. Springfield also produced 50,000 bayonet blades to be used as spare parts during this period.

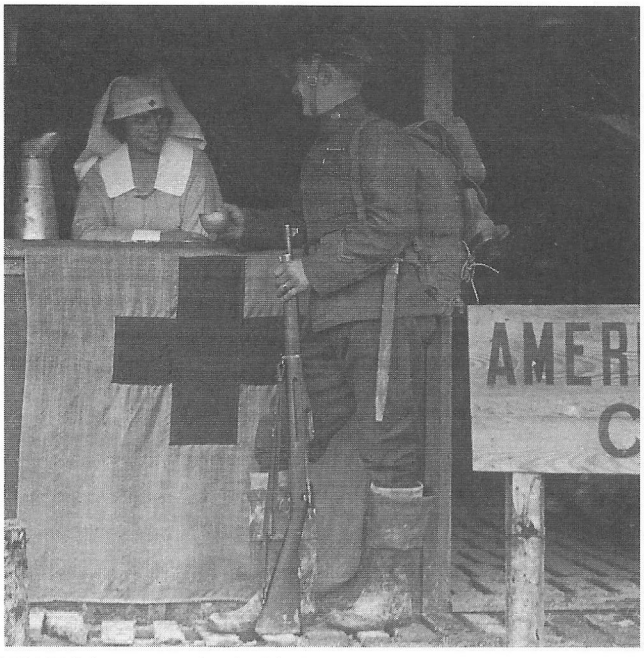
The M1905 bayonet remained in production at Springfield and Rock Island until manufacture ceased in 1920. Large numbers remained on hand and saw widespread issue during World War II. A modified version of the M1905 bayonet was placed back into production in 1942 by several civilian firms.

The M1905 bayonet, along with the M1903 Springfield rifle, has become almost symbolic of the Doughboy of the First World War. Whether used to broil stolen chickens or wielded in the deadly work of assaulting enemy trench positions, the M1905 bayonet provided valuable service to the troops of the AEF. The fact that the M1905 bayonet (or a slightly modified version) remained in service for forty years illustrates the basic soundness of the design.



Doughboys firing their M1903 rifles from foxholes. Note the attached M1905 bayonets with bright-finished blades. (National Archives)



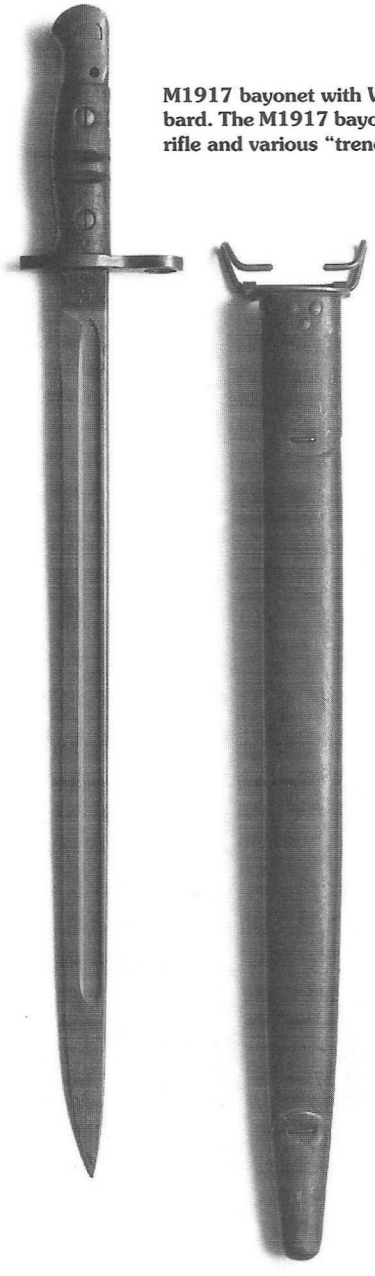


(above, left) Group of Doughboys. Note the M1903 rifle with attached M1905 bayonet — bright blade. (National Archives)

(above, right) Doughboy "chatting up" a volunteer at a Red Cross canteen. The soldier is carrying his M1905 bayonet in a M1917 scabbard. It is not widely known that the M1917 scabbard was authorized for use with both the M1905 and M1917 bayonets. (National Archives)

M1917 "U.S. Enfield" Bayonet

The bayonet that has the distinction of being made and issued in larger numbers than any other U.S. bayonet during WWI is the M1917 bayonet. The item also is unique in that it was adopted for use with two different types of firearms.



M1917 bayonet with WWI production M1917 scabbard. The M1917 bayonet was used with the M1917 rifle and various "trench shotguns" during WWI.

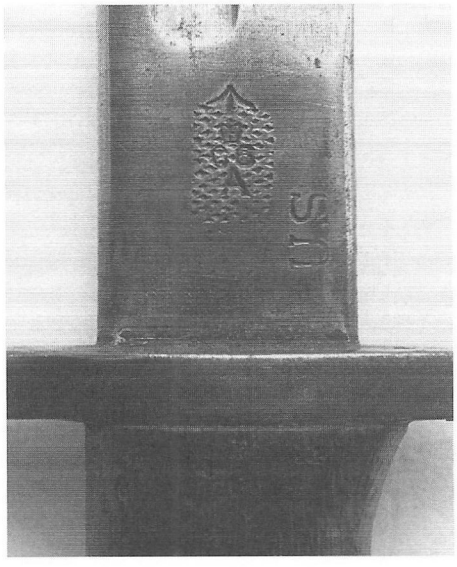
(below, left) Photo of British Pattern 1914 bayonet taken into United States service for use with the newly adopted M1917 rifle. Note the cancelled British property markings and the "US" marking added.

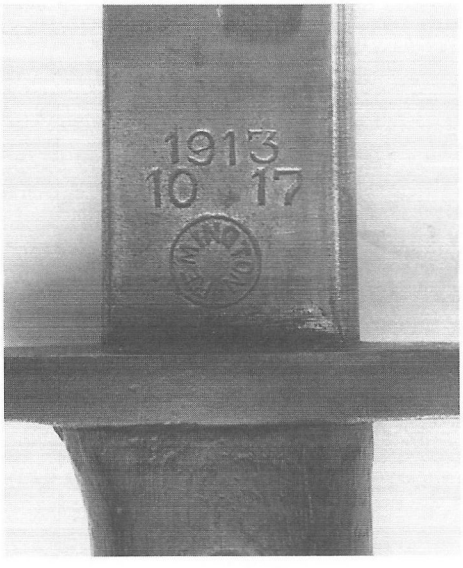
(below, right) Markings on P14 bayonet taken into United States service. This example was made by Remington Arms Company.

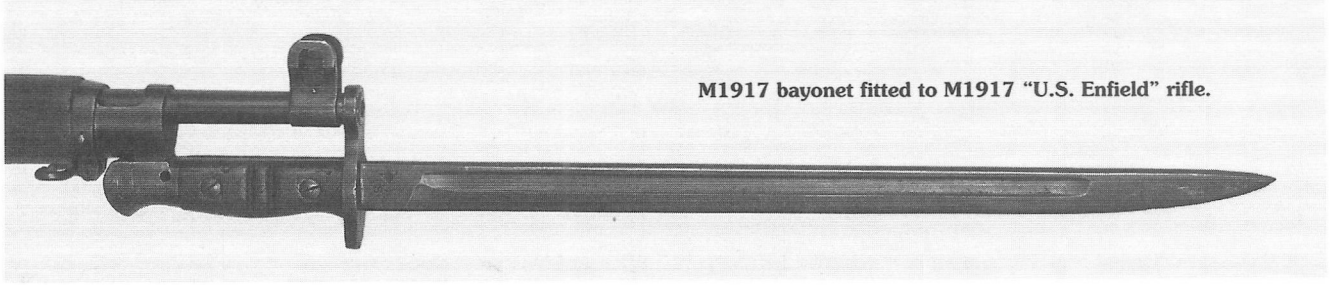
The M1917 bayonet was adopted by the United States concurrent with standardization of the U.S. Rifle, Caliber .30, Model of 1917. The M1917 rifle and bayonet were British designs that were slightly modified and adopted by the United States as an expedient measure soon after our declaration of war. Both the rifle and bayonet were copied directly from the British Pattern 1914 (P14) rifle and bayonet that were produced in the United States under contract prior to our active involvement in the war. The United States government purchased approximately 545,500 Pattern 1914 bayonets originally produced under British contract after we entered the war.

The M1917 bayonet featured a blade 17" in length and 1½" wide. The overall length was 21.8". The bayonet was fitted with walnut grips and a transverse locking plunger.

Just over two and a half million M1917 bayonets (including the P14 bayonets purchased from the British) were manufactured from 1917 until production ceased shortly after the end of WWI. Winchester Repeating Arms Company and Remington Arms Company produced the bayonets. Winchester delivered 395,894 M1917 bayonets, and Remington's total production was 1,565,644. Interestingly, the largest

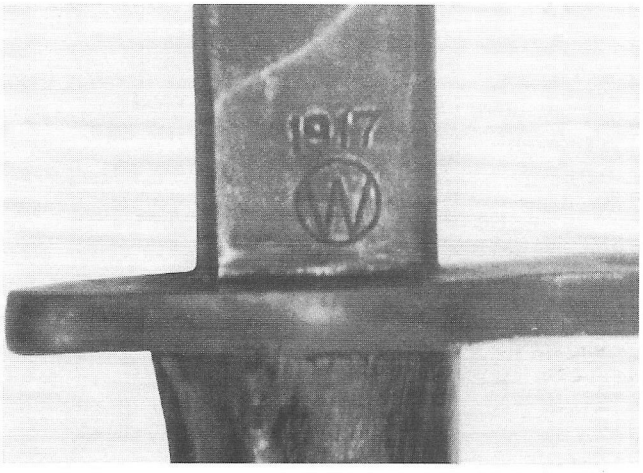






M1917 bayonet fitted to M1917 "U.S. Enfield" rifle.

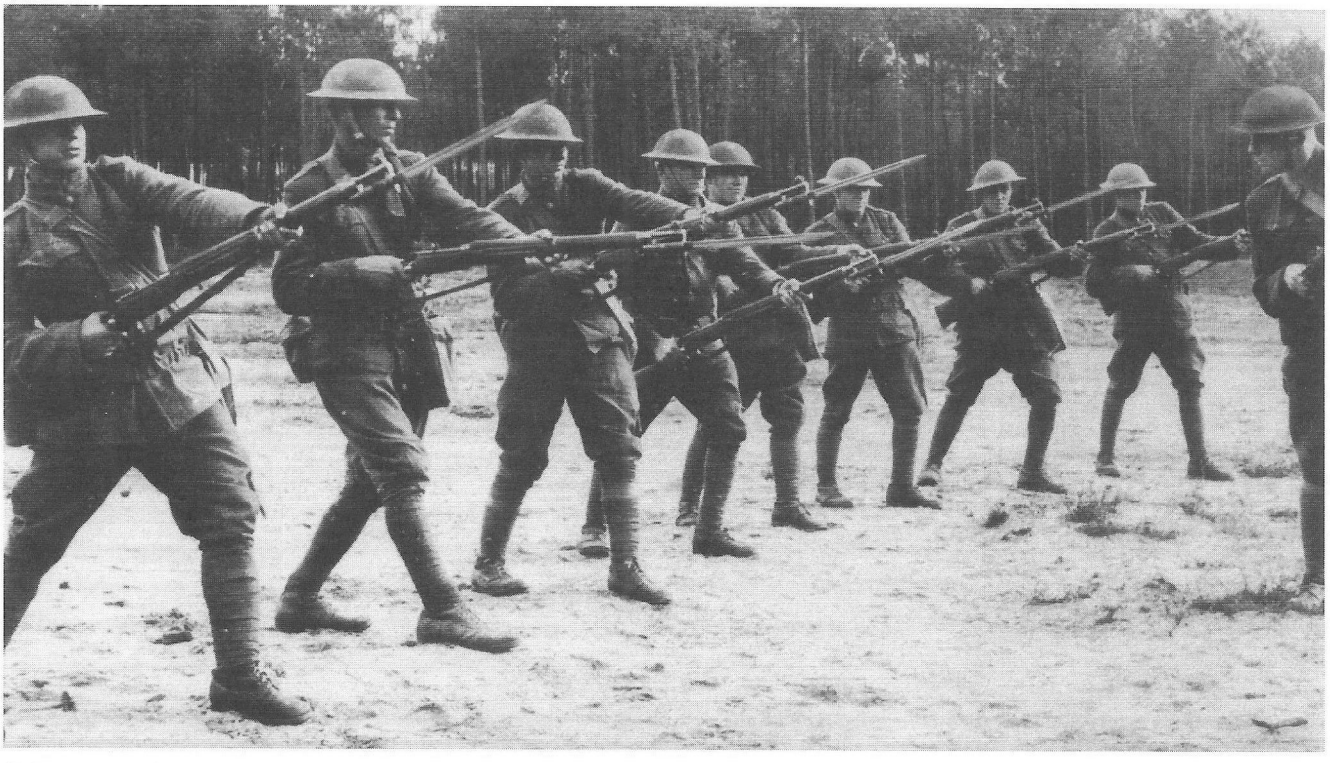
manufacturer of M1917 rifles, Eddystone (an affiliate of Remington), did not produce any M1917 bayonets. The blades were stamped with the identity of the manufacturer (either a circled "W" to denote Winchester or "Remington" arrayed in a circle) and the year of production on the reverse and an Ordnance Department "flaming bomb" insignia and "US" on the obverse. The bayonets made under British contract that were taken over by the United States early in the war had the English markings defaced and U.S. markings overstamped. They were officially considered M1917 bayonets. Unlike the M1905 bayonets, M1917 bayonets were not serially numbered. No "1918"-dated Winchester M1917 bayonets have been noted. It appears that Remington started marking their M1917 bayonets with the year of production (i.e., "1917" or "1918") but later reverted to marking all bayonets with the year of adoption ("1917") rather than the year of production.



Typical blade markings on U.S. M1917 bayonet. This example was made by Winchester Repeating Arms Company.

Although bright, blued and browned finishes have been reported, virtually all of the M1917 bayonets will exhibit a "two-tone" finish on the blades. The guard, hilt and ricasso were blued, and the balance of the blade had a grayish phosphate finish. After WWI, large numbers of M1917 bayonets were overhauled. These will typically exhibit a different shade of parkerized finish with a rougher texture.

It is interesting to note that even though 1,961,538 M1917 bayonets were delivered to the government by Remington and Winchester (in addition to the 545,500 purchased from the British), this number was still over 500,000 bayonets less than the total of M1917 rifle production by the time manufacture ceased. This shortage of M1917 bayonets caused problems in stateside training camps, but apparently was not felt on the front lines in France. To alleviate the shortage, contracts were given to the firm of Landers, Frary & Clark for the production of 500,000 M1917 bayonets and to the National Motor Vehicle Co. for 255,000 of the weapons. Neither firm was able to get into production before the contracts were canceled due to the Armistice. If the war had lasted into the spring of 1919,



U.S. troops undergoing bayonet training in World War I with M1917 rifles and bayonets. (National Archives)

as anticipated, the additional production totals would have helped alleviate the M1917 bayonet shortage.

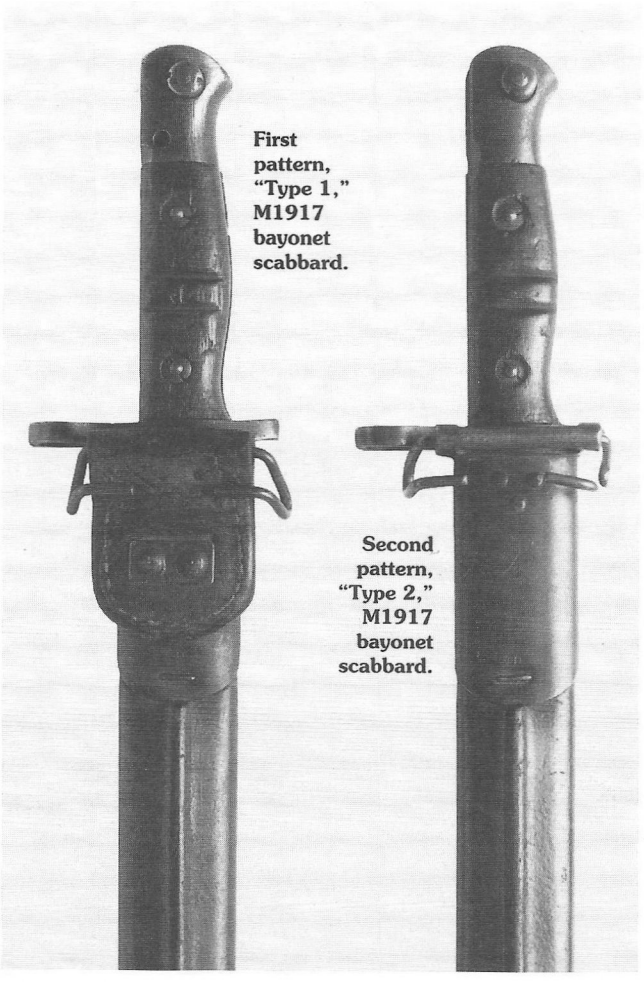
Two distinct variants of scabbards were manufactured during the First World War for use with the M1917 bayonet. The first type was made with a separate leather hanger that contained the cartridge belt hooks. The second type eliminated the separate leather piece and utilized a rolled metal tab extension to secure the cartridge belt hooks. The second pattern is more commonly seen today. The M1917 bayonet scabbard was constructed of green-colored leather with a metal tip. The identity of the manufacturer was stamped on back of the scabbard. The Jewell Belt Co. produced 1,810,675 M1917 bayonet scabbards, Graton & Knight Co. made 1,669,581 and Rock Island Arsenal turned out 3,000. It is interesting to note that the number of M1917 scabbards manufactured exceeded the number of M1917 bayonets produced. It is a little-known fact that the M1917 bayonet scabbard was also authorized for use with the M1905 bayonet.

During the latter part of the Second World War, a composition (plastic) scabbard was produced for the M1917 bayonet. Slightly modified versions of this scabbard were produced as recently as the late 1960s. Only the green leather scabbards were manufactured during World War I.

In addition to being used with the M1917 "U.S. Enfield" rifle, the M1917 bayonet was authorized for use with the combat shotguns ("trench guns") first produced and issued during World War I. These interesting weapons were riot-type shotguns with fitted adapters capable of mounting a bayonet. The M1917 bayonet was selected for use with the trench guns due, presumably, to the larger numbers on hand as compared to the M1905 bayonet. Another factor may have been the fact that the only two firms to manufacture trench guns during WWI were Winchester and Remington, and these were the same two companies that produced M1917 bayonets.

Government documents (dated 1918) indicate that the trench guns were to be issued to infantry units equipped with M1917 rifles. This was done in order to reduce supply problems since the trench guns and rifles could share a common bayonet. However, there is little evidence that these directives were carried out. The trench guns and M1917 bayonets were apparently issued to infantry units without regard to the type of service rifle used.

By the end of the war, the majority of Doughboys were armed with M1917 rifles and bayonets. Following the Armistice, these rifles and bayonets were retired to the war reserve stockpile. Large numbers of M1917 bayonets and rifles were refurbished (overhauled), and most remained in storage until utilized again as supplemental weapons and for foreign aid purposes during World War II.



Note the difference in the method of attaching the cartridge belt hooks.

The M1917 bayonet's service life was much longer than either the M1917 rifle or, for that matter, the M1905 bayonet. The M1917 remained the standardized bayonet for issue with trench shotguns well into the Vietnam War era. A modified version of the M1917 bayonet was placed into production by General Cutlery and Canada Arsenal in the late 1960s. These are noticeably different from the 1917–1918-vintage Remington and Winchester bayonets as they were not as well crafted and were fitted with checkered plastic grips.

The M1917 bayonet was a serviceable and effective weapon. The adopted British bayonet was equal to the American-designed M1905 bayonet as a combat weapon. Many Doughboys became familiar with the M1917 bayonet during basic training and in the brutal combat encountered on the Western Front. The M1917 bayonet served the troops of the AEF well.

Krag Bayonet

Not all of the U.S. bayonets of World War I were of the latest models or manufactured and issued in large quantities such as the M1905 and M1917 bayonets. In the hectic early days of the war, the U.S. military was grappling with the enormous logistical problem of procuring enough rifles and bayonets for training the large numbers of new recruits coming into service. Some obsolete military rifles, such as the U.S. .30-40 Krag, were taken out of storage and issued for training purposes. These arms were never intended to be used as front-line combat weapons, although several thousand were carried to France as supplementary service rifles. Their utilization allowed the modern M1903 and M1917 rifles (and bayonets) to be available for use by front-line combat units. Eventually, production of the new rifles increased to a sufficient level that allowed the Krag to be withdrawn from service.

The Krag bayonet was essentially unchanged since its adoption in 1892. No U.S. Krag bayonets were manufactured after 1903. The bayonet featured a 11¾" bright-finished blade with walnut grips. The obverse ricasso was marked "US", and the reverse was stamped with the year of production. The Krag bayonet was issued in an all-metal scabbard with a single metal belt hook. The Krag scabbard could be attached to the standard WWI-vintage cartridge belt, although it wasn't held as securely as with the M1910 scabbard. There was apparently little more than rudimentary bayonet training carried on with the Krag bayonet until it was replaced by either the M1905 or M1917 bayonet.

It may be surprising to some that an obsolete weapon such as the Krag bayonet saw service as late as World War I. Actually, it was a well-made and serviceable weapon and likely could have given a good account of itself in bayonet fighting if required. However, it was relegated to supplemental service use only.

U.S. Krag bayonet and scabbard.

U.S. Navy sailor in France ca.1917. Note the Krag bayonet attached to the Mills Krag cartridge belt.

Ross Bayonet

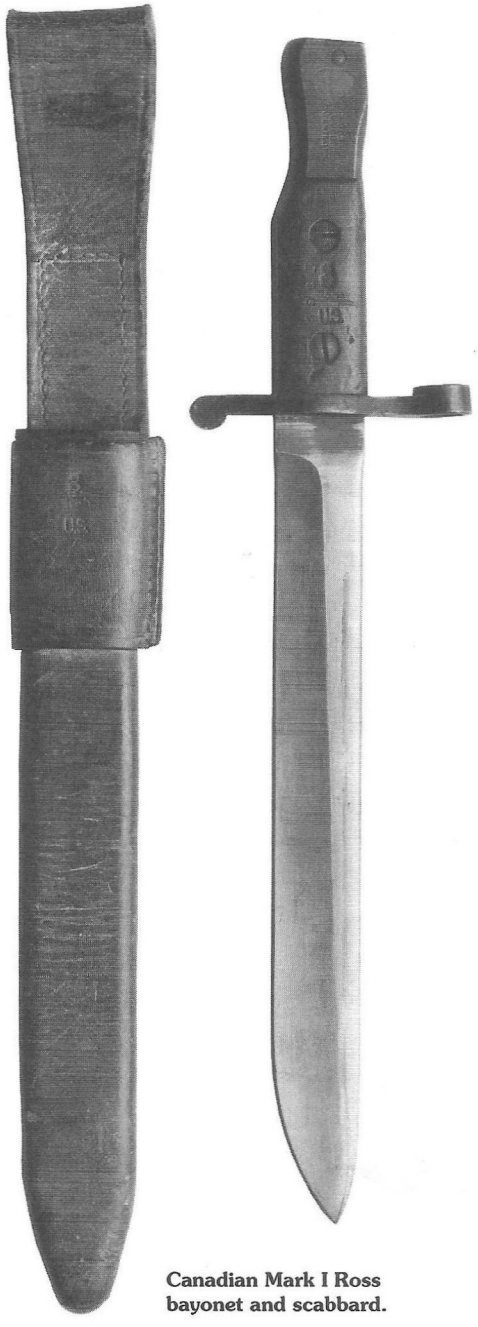
The previously mentioned shortage of service rifles and bayonets also resulted in the acquisition of 20,000 M1910 Ross rifles and a corresponding number of Mark I bayonets from the Canadian government in October of 1917. These rifles and bayonets had recently been withdrawn from front-line service with the Canadian army.

The Mark I bayonet featured the typical Ross pattern "butcher knife" configuration blade. The hilt and ricasso were parkerized, and the balance of the blade was bright. The blades were 10⅛" long and 1⅛" wide and were not marked. The pommel was stamped "Ross Rifle Co./Quebec" with patent dates.

The Ross bayonets were issued with brown leather scabbards having a reinforced throat and a long belt loop. The scabbard, like the bayonet, was very well made. When taken into United States service, the obverse grip of the Ross bayonet was stamped with an Ordnance Department "flaming bomb" insignia over "US". These same markings were also stamped on the front of the scabbard.

The Ross rifles and bayonets were issued to several U.S. Army training camps where they saw a modicum of training use late in 1917 and early in 1918 before they were withdrawn from service. As was the case with the Krag, the Ross bayonets were eventually withdrawn from service and replaced by the standardized M1905 and M1917 bayonets.

The U.S.-surcharged Ross bayonets and scabbards are still seen from time to time today but are somewhat scarce. Unlike the British-designed M1917 bayonet, the Canadian Mark I Ross bayonet was never formally standardized by the United States. Its use was strictly limited to an auxiliary training role. While they did not see any active combat use in the hands of American troops, the Ross bayonets did help alleviate the pressing shortage of weapons early in our active involvement in the war. Its role, albeit minor, should be noted.

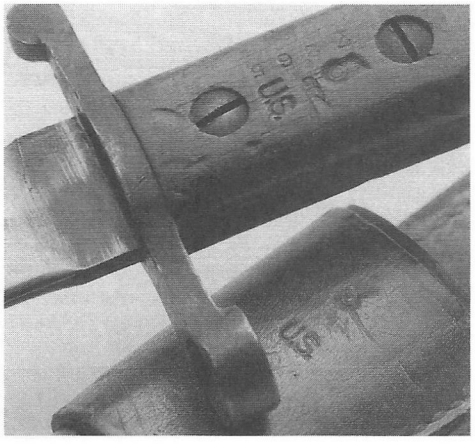


Canadian Mark I Ross bayonet and scabbard.

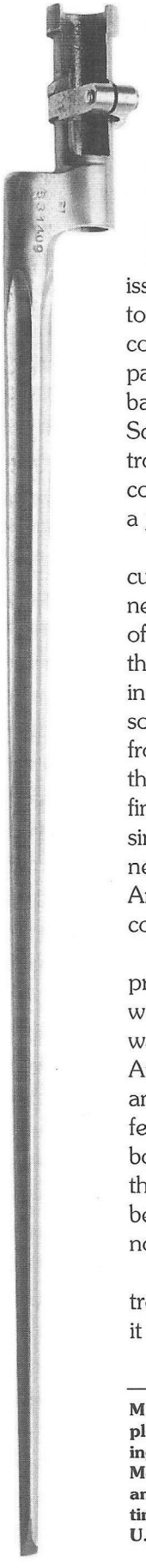
Mosin-Nagant Bayonet

Another type of rifle and bayonet originally produced for a foreign ally was acquired by the United States during the First World War. Prior to America's active involvement in the war, Czarist Russia contracted with two U.S. firms, Remington and New England Westinghouse, for production of its standard M1891 Mosin-Nagant service rifle.

The 7.62mm Mosin-Nagant was a somewhat anachronistic weapon as was its bayonet. The Mosin-Nagant bayonet was an all-metal socket bayonet with an angular blade not very different from bayonets dating back to the 1700s. The cruciform blade of the bayonet was made with four flutes and was 17" long and ⅝" wide. A locking ring secured the bayonet to the barrel. The tip of the bayonet had a chisel point and was reportedly used as a screw-



(right) Close-up view of United States inspection and property markings added to Ross bayonets and scabbards purchased by the War Department during World War I. Note the "flaming bomb" and "US" markings on both the bayonet grip and scabbard throat.



driver to open ammunition packing crates. The bayonet was blued. Apparently, the Mosin-Nagant bayonets made in the United States were produced by Remington and marked with a circled "R" and serial number. There have been no Westinghouse-marked specimens noted. Interestingly, the Mosin-Nagant bayonet was not issued with a scabbard, as it was intended to be affixed to the rifle at all times. This could obviously make for a cumbersome package and, particularly in training, the bayonet was often removed. Konrad Schreier, Jr. reports that the American troops who used the Mosin-Nagant rifle considered its bayonet as "...something of a joke compared to a knife bayonet."

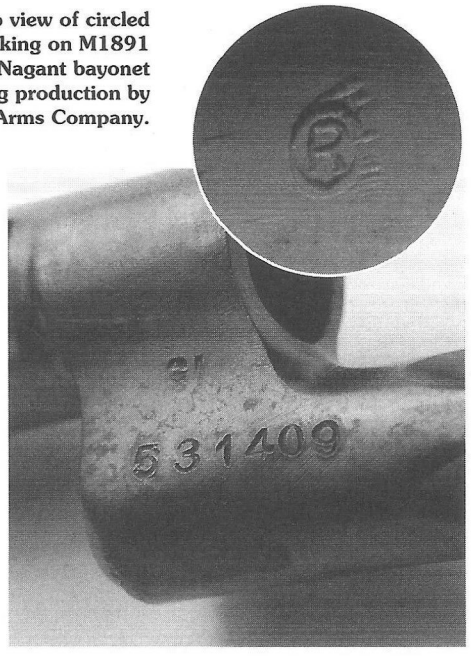
Unlike the Krag and Ross bayonets discussed previously, the Mosin-Nagant bayonet saw some combat service in the hands of American troops. After cancellation of the contracts due to the Bolshevik takeover in Russia, the United States purchased some 280,000 M1891 Mosin-Nagant rifles from the American firms that had produced them. This was done to prevent severe financial hardships of the firms involved, since their production capacity was vitally needed to produce weaponry for the American military. Also, the Russian rifles could be used for training purposes.

A number of the Mosin-Nagant rifles procured by the American government were issued for training use early in the war. The Mosin-Nagant bayonets issued to American troops did not normally have any special U.S. martial markings added. A few bayonets of this type with a "flaming bomb" marking have been reported, but the originality of such markings has not been confirmed, and the vast majority were not marked in this manner.

When a contingent of U.S. Army troops was sent to North Russia in 1918, it was decided that they should be armed with Mosin-Nagant rifles and bayonets in order to simplify ammunition supply problems. The American troops posted to Russia labored under trying and dangerous conditions. During this campaign, the Mosin-Nagant rifles and bayonets did see combat use in the hands of U.S. troops against the Bolshevik forces.

Despite the simplistic and obsolete design, the Mosin-Nagant bayonet has the distinction of being used by American troops in the historic, if little-known, North Russia campaign. Except for the Johnson rifle bayonet of WWII, the Mosin-Nagant was the last angular blade bayonet utilized by American troops.

M1891 Mosin-Nagant socket bayonet. This example was manufactured during World War I by Remington Arms Company. Unlike other bayonets, the Mosin-Nagant was not equipped with a scabbard and was intended to be affixed to the rifle at all times. This was not always the case, particularly in U.S. service.



Close-up view of circled "R" marking on M1891 Mosin-Nagant bayonet indicating production by Remington Arms Company.

Close-up view of serial number "531409" on M1891 Mosin-Nagant bayonet.

French Berthier and Lebel Bayonets

Some French Lebel and Berthier rifles and bayonets were used in France for training purposes by early contingents of the AEF. Also, a number of black Americans were incorporated into some French infantry units and were issued Lebel or Berthier rifles. The U.S. 360th through 372nd Infantry Regiments were issued French Berthier rifles and bayonets. Although they were distinctly different rifles, both the Lebel and Berthier were usually referred to as the "Lebel" in the United States. Although a knife-type bayonet was produced for a carbine version of the Berthier (the M1892 carbine), the infantry rifle versions of the weapon took the same type of bayonet as the Lebel.

The Lebel/Berthier rifles were issued with the "Model 1886" bayonet. This weapon was a unique, quatrefoil blade, spike-type bayonet. The hilts were constructed of brass or aluminum. The bayonet was generally 25½" in overall length, although shorter

specimens may be found. Many also had a hooked quillon. Several variations exist and are designated by the year of the modification. For example, the type of bayonet used after 1916 was designated as the "M1886/93/16" to reflect the original date of adoption (1886) as well as subsequent dates of modification (1893 and 1916).

The Lebel/Berthier spike bayonet was sometimes, with grim humor, referred to as a "knitting needle." It has been reported that the French soldiers ("poilu") sometimes, affectionately, referred to the bayonet as "Rosalie."

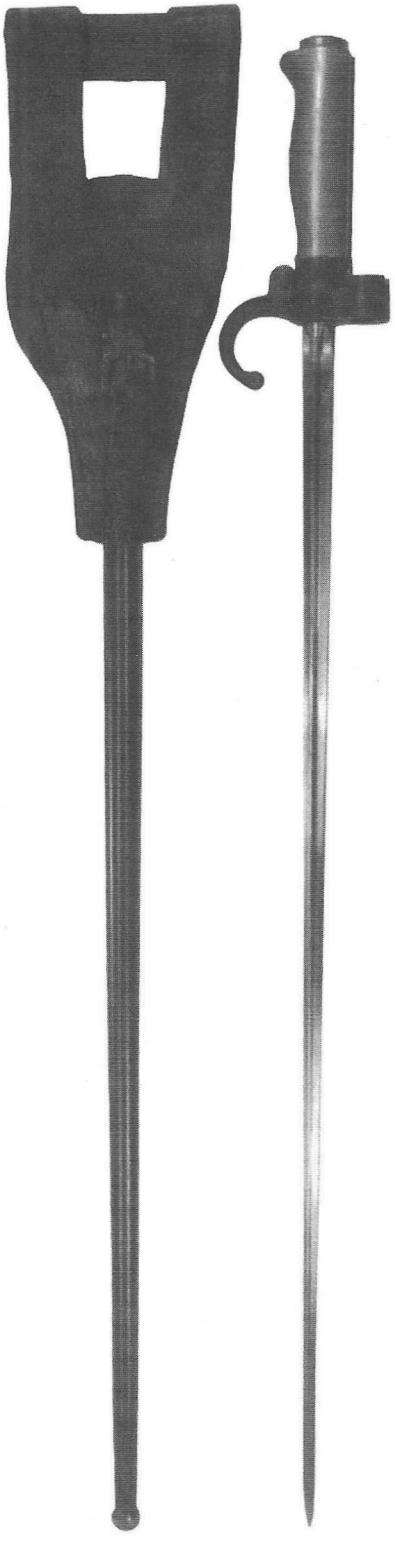
The Berthier/Lebel bayonet was not adopted by the United States, and its use was confined to limited training and issue to black Americans serving in French infantry units.

British Pattern 1907 Mark I Bayonet

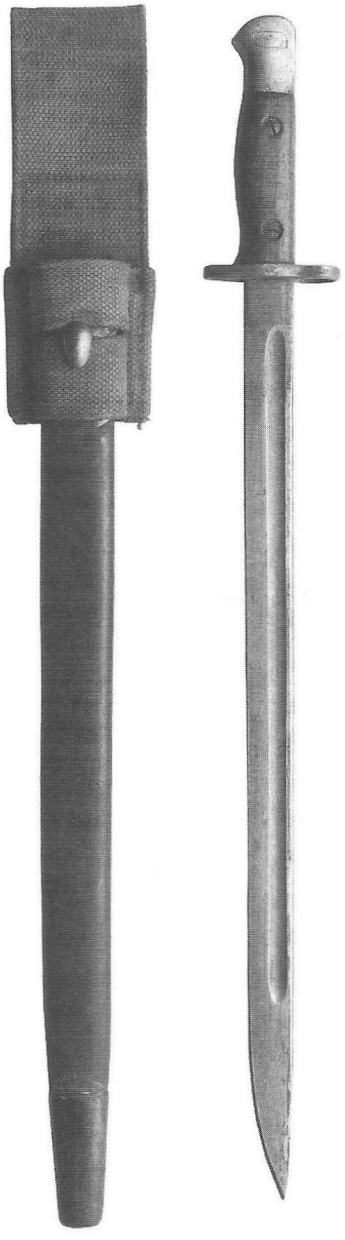
American troops training with British units were often issued the standard Lee-Enfield (SMLE) .303 rifle. The Pattern 1907 Mark I bayonet used with the SMLE was very similar to the British Pattern 1914 and U.S. M1917 bayonets including the same 18" sword-type blade and a virtually identical hilt. The P1907 bayonet was marked "1907" to denote the pattern number and was normally stamped with the month and year of production along with the initials of the manufacturer and various English government proof and property markings. Large numbers of P1907 bayonets were made, including 100,000 produced in the United States by Remington in 1915.

The P1907 bayonet was issued with a leather scabbard having a brass throat. The scabbard was attached to the cartridge belt by means of a canvas hanger. The hanger was normally stamped with a "Broad Arrow" British government property marking, and the scabbard was normally unmarked.

When issued to American troops, the Pattern 1907 bayonet scabbard was usually attached to the standard U.S. infantry cartridge belt.



(left) French M1886 bayonet and scabbard. This pattern bayonet was standard issue during WWI for the Lebel and Berthier rifles.
(Hayes Otoupalik collection)



(right) British Pattern 1907 bayonet as issued with the SMLE rifle. This rifle and bayonet were used to a limited extent by some American units temporarily attached to the British during WWI. The bayonet is accompanied by the original scabbard and canvas frog.

Trench Knives

While bayonets had been around for centuries, the First World War spawned the widespread issue of combat knives to the average infantryman. The use of knives by soldiers was certainly not unknown prior to WWI, but the unique aspects of trench warfare made the widespread issuance of combat knives a logical step. The various combat knives issued during the war soon became collectively known as "trench knives" due to their application in trench warfare. All of the belligerents were issued some form of trench knife during the course of the war. Some were fabricated from modified obsolete bayonets and others were of commercial origin. When the United States entered the war, there were no modern combat knives in Uncle Sam's arsenal, and the Ordnance Department quickly sought a suitable design.

M1917 and M1918 Trench Knives

The development of the first United States military trench knife is discussed in the excellent book *America's Munitions 1917–1918* by the Assistant Secretary of War and published in 1919 by the War Department. As stated in the book:

A new weapon which had come into use during the Great War as part of the soldier's individual equipment was the trench knife. The Government took up the question of making such knives with various manufacturers throughout the country and they were given a general idea of what was required and, in conjunction with the Ordnance Department, were requested to develop details. The design submitted by Henry Disston & Sons, of Philadelphia, received the most favorable consideration.

The Disston design featured a slender, sharp-pointed 9" triangular blade, actually little more than a sharpened spike, attached to a wooden handle with a metal knuckle-bow guard. The slender triangular blade was favored because it could easily pierce thick clothing. It is interesting to note that the original specifications issued by the government specifically mentioned that the knife should be capable of penetrating *German* overcoats! This certainly left no doubt as to the intention of the weapon.

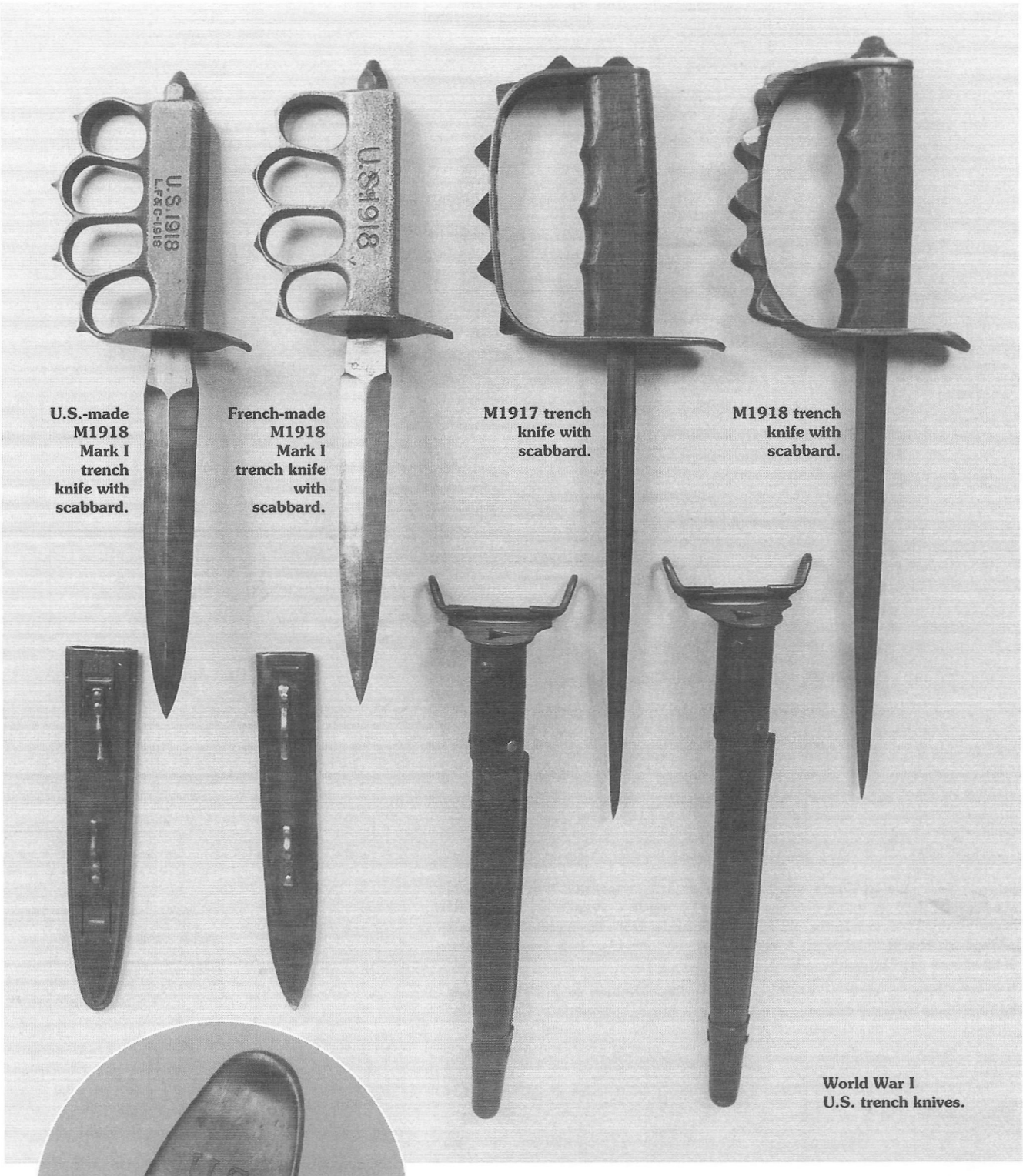
The Disston knife was adopted and standardized as the "Model of 1917." The metal knuckle-bow had pyramidal-shaped projections and the grip was fashioned of wood. All metal parts were blued. The initials of the manufacturer, "U.S." and the date of production were stamped on the face of the guard or inside the knuckle-bow.

In late 1917 or early 1918, the original design of the M1917 trench knife was slightly changed. Rather than a knuckle-bow with the pyramidal-shaped projections, the guard was fabricated by bending the ends into five flanges on each side. The profile of the handle was slightly changed, but the knife was otherwise essentially the same as the M1917 including the length and configuration of the blade. Apparently, a number of M1918 trench knives were manufactured prior to the year of the new variant's adoption, as "1917"-dated specimens are not uncommon. While there were some cosmetic differences, the M1917 and M1918 trench knives were functionally the same, and no real distinction was made between the two patterns in service. They are generally referred to today as the "M1917/1918" trench knives.

The M1917/1918 trench knives were issued with a cylindrical leather scabbard having a metal throat fitted with cartridge belt hooks and a metal tip. The leather was tinted green and resembled the M1917 bayonet scabbard in texture and color. An alternate leather scabbard of different construction (without belt hooks) was considered for use with the knives but few, if any, were actually produced or issued. The same type of scabbard was issued with the M1917 and M1918 trench knives.

Both knife variants (M1917 and M1918) were manufactured by several companies including the original designer, Henry Disston & Sons (marked "H.D.&S."). The other firms that produced M1917/1918 trench knives in larger numbers were Landers, Frary & Clark (marked "L.F.&C."), Oneida Community, Ltd. (marked "O.C.L.") and American Cutlery Co. (marked "A.C.Co."). American Cutlery stamped its markings inside the knuckle-bow while the other manufacturers typically stamped the markings on the face of the guard. Depending on the model and year of production, "1917" and "1918" dates will be noted. The walnut handle of the LF&C trench knife had slightly shallower finger grooves than found on the knives made by the other firms.

Judging from contemporary reports and vintage photographs, the M1917/1918 trench knives saw wide issue within the ranks of the AEF. It was a serviceable design for some combat applications. The metal knuckle-bow could be useful in hand-to-hand fighting (not an uncommon occurrence in trench warfare), and the blade could indeed penetrate heavy clothing with ease. However, the fact that the knife only permitted a straight stabbing method of use, and could not be utilized in a slashing mode, prevented it from being an optimum combat weapon.



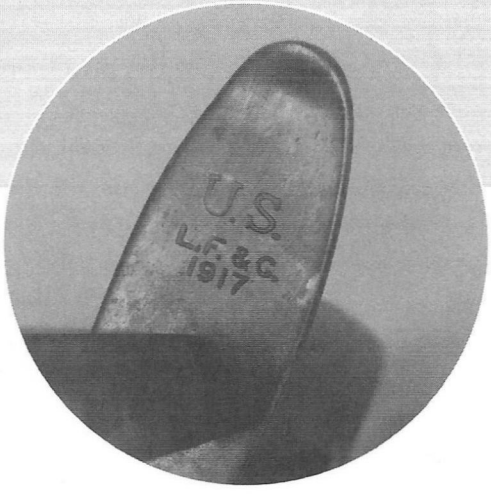
U.S.-made M1918 Mark I trench knife with scabbard.

French-made M1918 Mark I trench knife with scabbard.

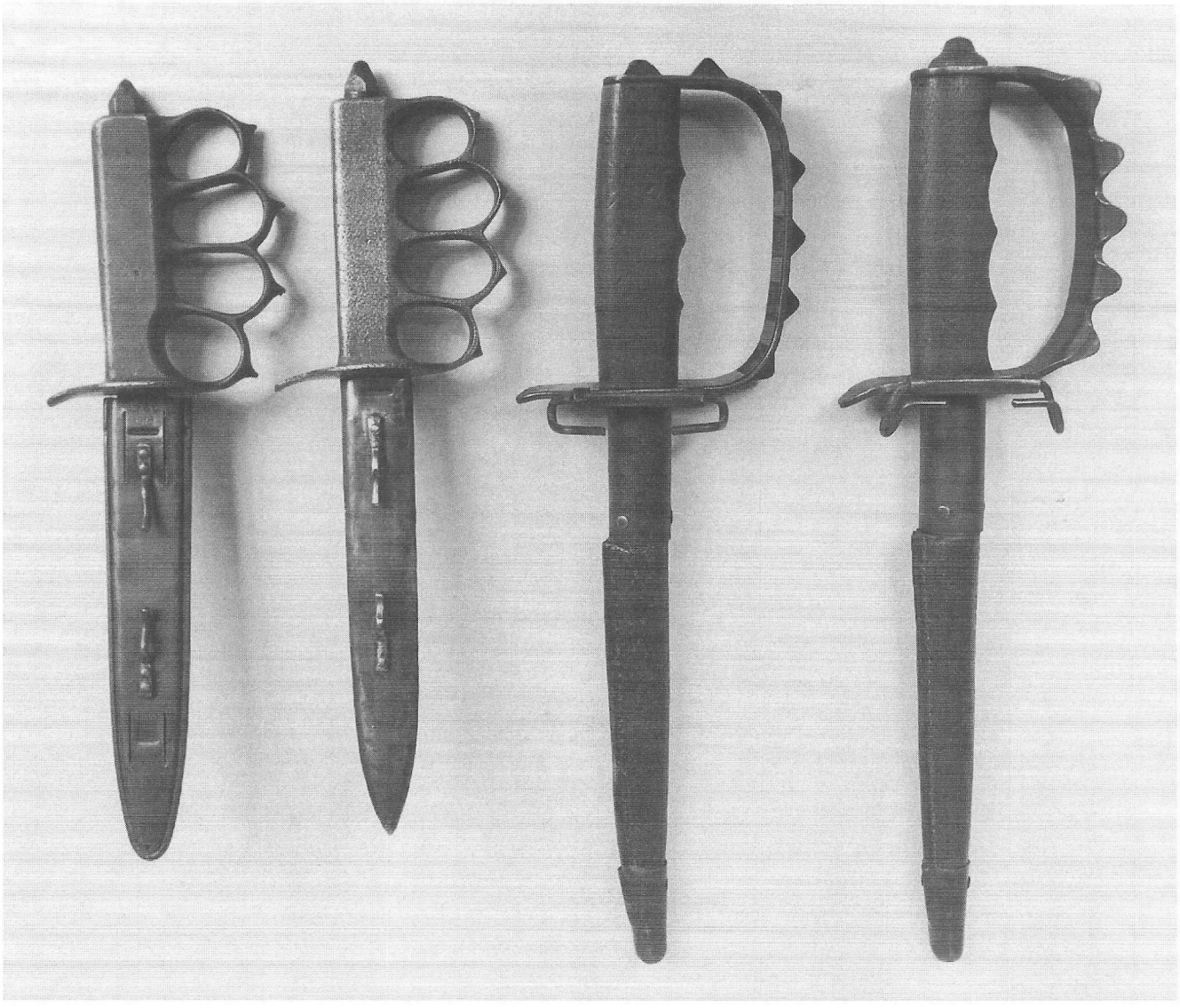
M1917 trench knife with scabbard.

M1918 trench knife with scabbard.

World War I U.S. trench knives.

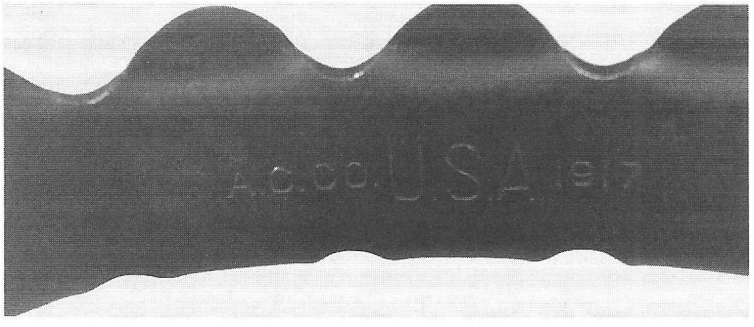


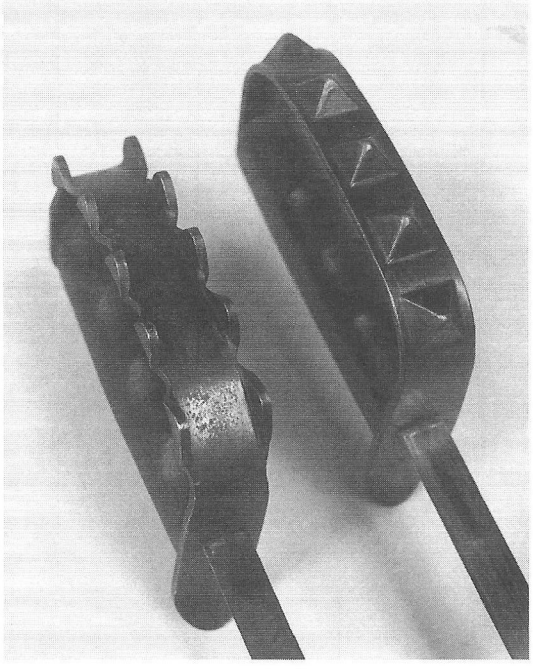
Close-up view of markings on M1917 trench knife. This example was manufactured in 1917 by Landers, Frary & Clark.



(above) Rear view of World War I U.S. trench knives inserted into respective scabbards. (left to right) U.S.-made M1918 Mark I, French-made M1918 Mark I, M1917 trench knife, M1918 trench knife. Note the metal attachment prongs on the M1918 Mark I knives and the cartridge belt hooks on the M1917 and M1918 scabbards.

(below) Close-up view of markings inside knuckle-bow of M1918 trench knife. This is an early example dated "1917" made by American Cutlery Co.





(photo at right) At left is knuckle-bow area of M1918 trench knife; at right, knuckle-bow area of M1917 trench knife.

U.S. Doughboys firing M1903 rifles. Note the M1917/1918 trench knife on the belt of the soldier at the far left. (National Archives)

M1918 Mark I Trench Knife

With these limitations in mind, the U.S. military began evaluating other types of trench knives with the intent of finding a better design to replace the M1917/1918 knives. As stated in *America's Munitions*:

On June 1, 1918, the American Expeditionary Force made an exhaustive test, comparing the various trench knives used aboard. The four knives tested were as follows: United States, model 1917; Hughes; French; and British knuckle knife. These tests were made to determine the merits of the different knives as to the following points:
(a) Serviceability — ability to carry in hand and function other arms.
(b) Quickness in action.
(c) If the soldier were knocked unconscious, would the knife drop from hand?
(d) Suitability to carry in hand while crawling.
(e) Probability of being knocked out of hand.
(f) Weight, length, shape of blade.
(g) Shape of handle.

It was found that the model 1917, although a satisfactory knife, could be improved...

The testing of the various foreign trench knives as compared to the M1917 resulted in a knife jointly developed by the American Expeditionary Force and the Engineering Division of the Ordnance Department. According to Asst. Secretary of War Benedict Crowell, this knife "...was a combination of all the good points of all the knives used by the foreign armies."

The new trench knife had a conventional 6¾" double-edged flat blade rather than the triangular blade of the M1917/1918 knife and a cast bronze handle having a "brass knuckle" configuration. The knife also had sharp projections on the outside of each of the four finger stalls as well as a metal "skull crusher" pommel. The new knife was standardized as the "Model of 1918, Mark I." It was to be supplied with a stamped, sheet metal scabbard with two attachment prongs. The blade had a dark blue/black finish and the handle was chemically blackened, as was the scabbard.

An Ordnance Department report on the subject commented that:

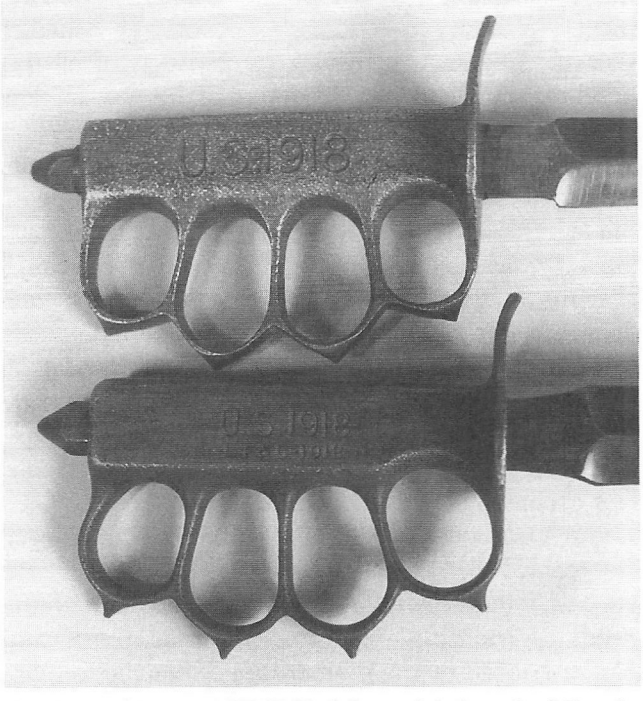
The requirements of the field demanded hundreds of thousands of trench knives, murderous blades backed by the momentum of heavily weighted handles, which in turn were protected by guards embodying the principle of the thug's brass "knucks" armed with sharp points.

The government soon placed orders for 1,232,780

M1918 Mark I trench knives. The firms awarded contracts for the new weapon were Landers, Frary & Clark, Oneida Community, Ltd., Henry Disston & Son and A.A. Simmons & Son. The first deliveries were scheduled for December of 1918. The right side of the handle was stamped "U.S. 1918", the initials of the manufacturer and actual year of production.

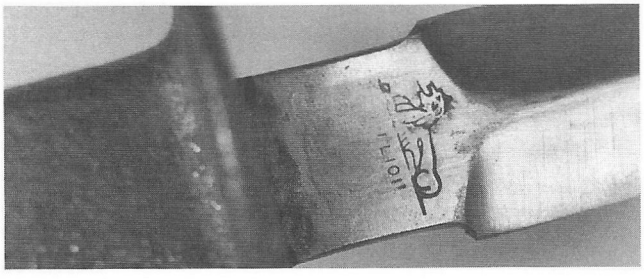
While the American companies were tooling up to produce the M1918 Mark I trench knife, the Ordnance Department made arrangements with a French firm to manufacture a version of the weapon. This was presumably done in an attempt to get the new knife in the hands of the Doughboys as soon as possible during the lag time required for the domestic firms to begin production. A knife manufactured in France was very similar to the M1918 Mark I trench knives that were made by the American firms was. This knife had virtually the same pattern blade and handle as the U.S.-made M1918 Mark I knife. The knuckle projections were not as pointed as the American-made variety, and the handle had a rougher textured finish and was not blackened. The blade was left bright and marked with a figure of a reclining lion and the words "Au Lion" (often lightly or partially stamped) on the ricasso. The handle was boldly stamped "U.S. 1918" on the right side. The unmarked scabbard was constructed of iron

U.S. M1918 Mark I trench knife with scabbard as made by Landers, Frary & Clark.



Handle markings on M1918 Mark I trench knives. (top) French-made version; (bottom) U.S.-made version as manufactured by Landers, Frary & Clark. Note the rougher textured handle on the French-made knife and the differences in the projections under each "finger stall."

Handle markings of U.S. M1918 Mark I trench knife made by Henry Disston & Sons. (Hayes Otoupalik collection)



Close-up view of blade markings on French-made "Au Lion" M1918 Mark I trench knife. The partially obscured markings are typical.

Patrol of the 166th Infantry, 42nd Division. Note the M1917 trench knives in the belts of the two middle patrol members. The soldiers are also armed with M1903 rifles, a Chauchat automatic rifle and M1911 .45 pistols. (U.S. Army Military History Institute)

(plated and chemically darkened or blued) with a somewhat different configuration than the stamped sheet metal U.S. scabbard. The number of French "Au Lion" M1918 Mark I trench knives produced for the U.S. government is not known, nor is the initial date of issue. It is quite probable that this variant got into the hands of U.S. troops well before the M1918 Mark I knives were slated to arrive in France. The French-made variety was officially given the same "M1918 Mark I" nomenclature as the U.S.-made trench knife and no real distinction was made between the two types.

Only 119,424 M1918 Mark I trench knives were produced in the United States before all orders were canceled due to the Armistice. The only firm to manufacture the knife in quantity was Landers, Frary & Clark, although Disston and Oneida made a handful.

Few, if any, of the U.S.-produced M1918 Mark I trench knives were shipped overseas prior to the cessation of hostilities. As stated, it is probable that some of the French "Au Lion" M1918 Mark I knives made it into the trenches before the surrender of Germany. The M1918 Mark I was classified as "Limited Standard" after WWI and many were issued during the Second World War to paratroopers and other specialized troops.

While it was a decided improvement over the M1917/1918 knife, the M1918 Mark I was not without its flaws. The double-edged blade permitted it to be used in the various slashing/stabbing applications required of a true combat knife, and the brass knuckle grip with individual finger stalls gave the user a more certain grip on the knife. These advantages, however, were offset by the fact that the handle permitted only a "clenched fist" type of grip. This precluded the knife being easily shifted from one type of hand position to another and limited the weapon's overall utility as a combat knife. Nevertheless, the sharp, double-edged blade and brutal brass knuckle grip made for a fearsome-appearing weapon.

The official authorization of trench knives was 1,920 as outlined in the "Table of Organization & Equipment" (TO&E) for an infantry division in 1918. As was the case throughout the war, the official TO&E requirements were often quite different from what was actually issued within the ranks.

Regardless of the type used, a trench knife could be a formidable weapon for the hand-to-hand combat often encountered in the brutal trench warfare environment. A WWI combat veteran, Arthur Guy Empey, related the following in his book *Over the Top*:

The knuckle knife is a dagger affair, the blade of which is about eight inches long with a heavy steel guard over its grip. The guard is studded with steel projections. At night in a trench, which is only about three or four feet wide, it makes a handy weapon. One punch in the face generally shatters a man's jaw and you can get him with the knife as he goes down.

Although Empey described a British pattern trench knife, all trench knives with metal knuckle-bows or brass knuckle handles could be used with the same measure of brutal efficiency. The trench knife is a vivid example of the horrors of trench warfare and the terrible ways that humans have devised to kill each other.

While widely considered as a WWI-vintage weapon, the M1918 Mark I trench knife actually saw much more use in the Second World War. The M1917/1918 trench knives, on the other hand, were widely issued to the AEF contingent and are classic weapons of the First World War. All types are interesting and desirable collectibles.

Bolos

The bolo is sometimes forgotten when considering the edged weapons of World War I. The issuance of bolos to the U.S. military began soon after the conclusion of the Spanish-American War. As our troops were deployed to the Philippines during the so-called "pacification" campaigns, the need for a weapon that was capable of cutting jungle undergrowth soon became evident. The native Filipinos had used a knife with a thick blade for such purposes for centuries. While numerous designs were encountered, the knives of this type were collectively referred to as "bolos."

In addition to being useful as a brush-cutting tool, the heavy bolo blade could also be a formidable weapon, as many of our soldiers found out while battling the fierce Moros of the Philippines. The U.S. Army experimented with several types of combination bolo/bayonet designs for the Krag and M1903 rifles before abandoning this flawed concept in favor of a single-purpose bolo. A First World War vintage Ordnance Department manual describes a bolo as:

The bolo, as issued in the service, is a heavy brush knife, useful for clearing brush, sharpening pegs, or valuable for personal combat in extreme cases.

While differing somewhat in configuration from a traditional bolo design, the U.S. Army purchased a number of large, heavy-bladed knives from the firm of Collins & Co. of Hartford, Connecticut. The knife was designated as the "No. 1005" by Collins, and was reportedly procured by the U.S. Army as early as the turn of the century. It featured a curved and quite heavy bright finished blade that was about 15⅛" long. Some of the blades were marked "US-ED" ("United States [Army] Engineering Department").

Three distinct variants of the Collins No. 1005 knife exist. The earliest (and scarcest) variety had a green horn handle. A second, and more common, variant was fitted with a wooden handle. A third pattern also had a wooden handle but with the addition of a steel ferrule between the handle and blade.

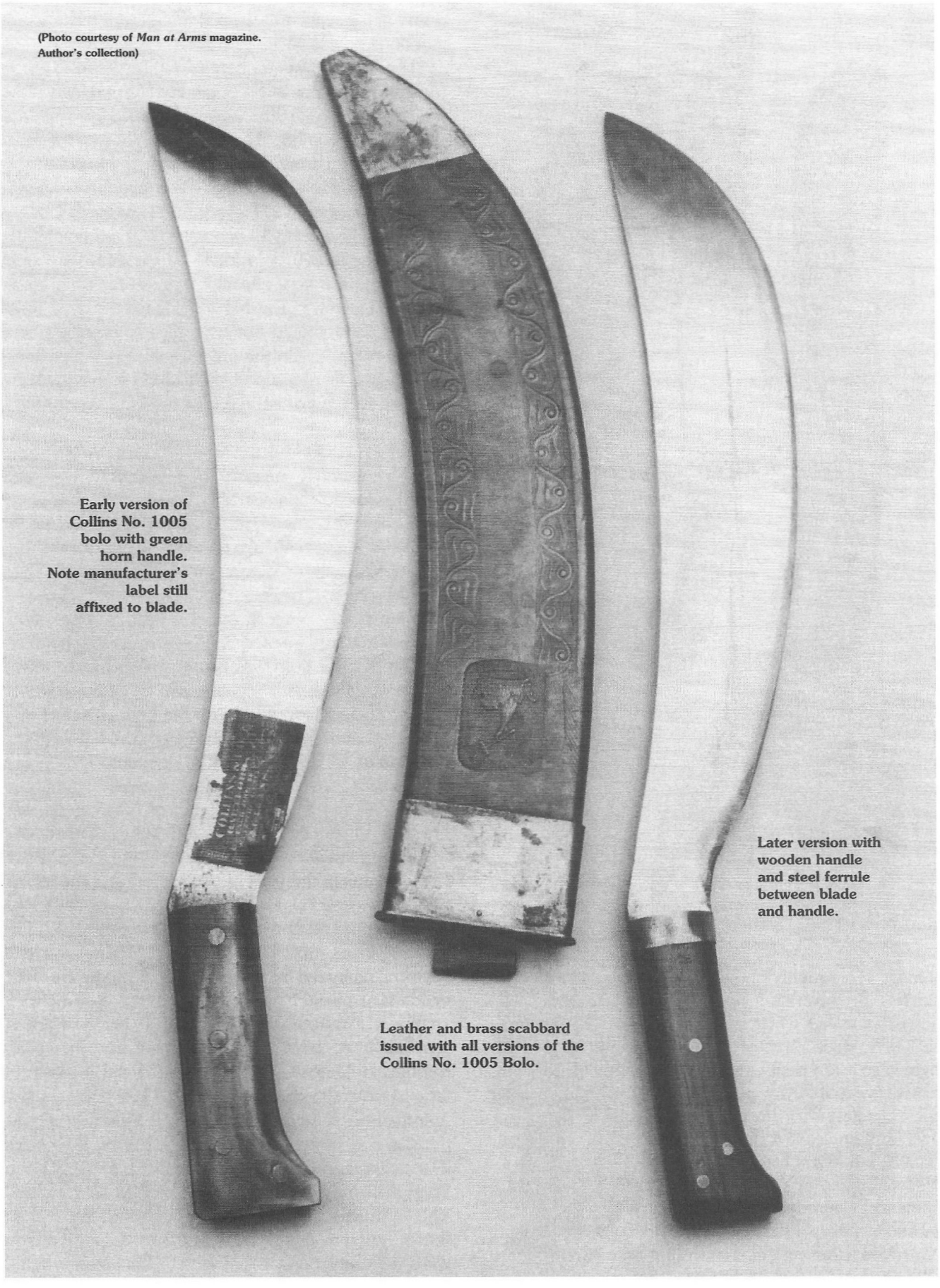
All three variants were issued with the same type of tooled leather scabbard having a wide belt loop. U.S. Army unit markings were commonly applied to the scabbards.

As with many of the bolos, the Collins No. 1005 was not specifically designed as a combat weapon. The Collins knife saw limited issue to army engineers and similar personnel and was not widely used by infantrymen. However, it is significant as it was among the first bolo-type knives procured by the U.S. Army.

M1904 Hospital Corps Knife

Another early bolo-type knife acquired by the United States military was the "Model of 1904 Hospital Corps Knife." The rounded tip, bright-finished blade was 12" long and quite heavy. The blade was marked with the year of production on the reverse side. Except for the first year of production (1904), a "US" and a serial number was marked on the obverse. After 1907, a "flaming bomb" insignia and "S.A." (for Springfield Armory) was stamped above the year of production. The walnut grip had finger grooves and was fitted with a brass cap on the end. The M1904 knives were manufactured by Springfield Armory between the years 1904 and 1915. Total production was 39,919 units.

The M1904 knife was issued with a well-made, heavy brown leather scabbard produced by Rock Island Arsenal. Prior to 1909, the scabbard had a long leather belt loop stamped with Rock Island Arsenal markings and the year of production. After 1909, the leather loop was replaced by a metal belt attachment.

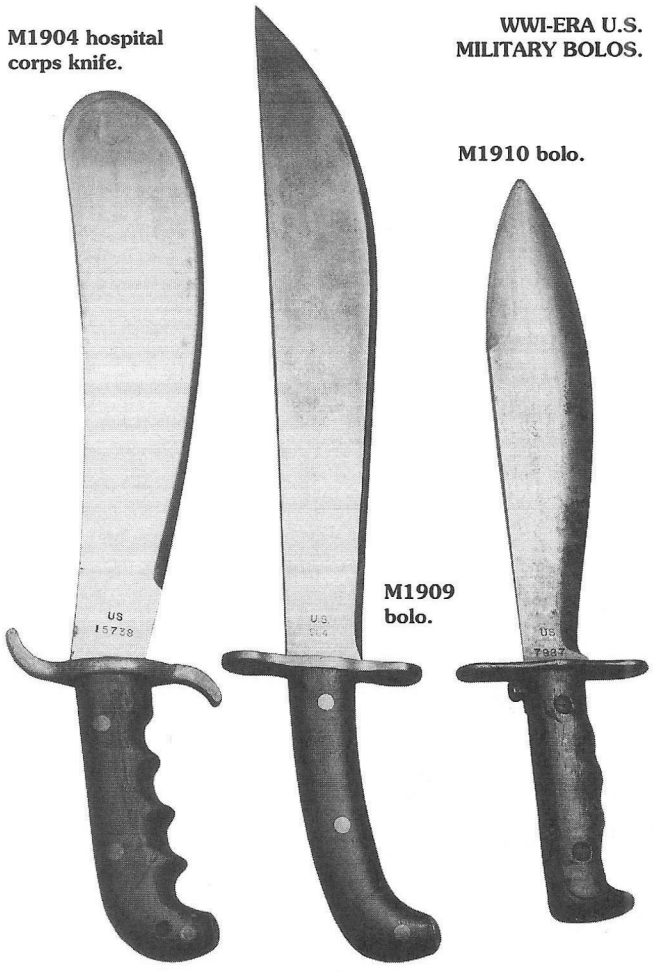


(Photo courtesy of *Man at Arms* magazine. Author's collection)

Early version of Collins No. 1005 bolo with green horn handle. Note manufacturer's label still affixed to blade.

Leather and brass scabbard issued with all versions of the Collins No. 1005 Bolo.

Later version with wooden handle and steel ferrule between blade and handle.



Some of the scabbards were stamped with military unit markings on the back.

The M1904 was an item of regular issue to Army medical personnel through the First World War. Like the Collins No. 1005 knife, the M1904 was not designed for combat. The M1904 knife was intended for field use by army medical personnel. However, it is not unrealistic to assume that a few may have "unofficially" found their way into the hands of some Doughboys for use during trench raids and other combat duties. The heavy bolo blade of the M1904 would have made it a very effective weapon for such applications. However, the M1904 Hospital Corps knife was not, and should not be, officially classified as a combat weapon. On the other hand, it is a very interesting example of a superbly crafted U.S. military knife and was an item of issue during the First World War.

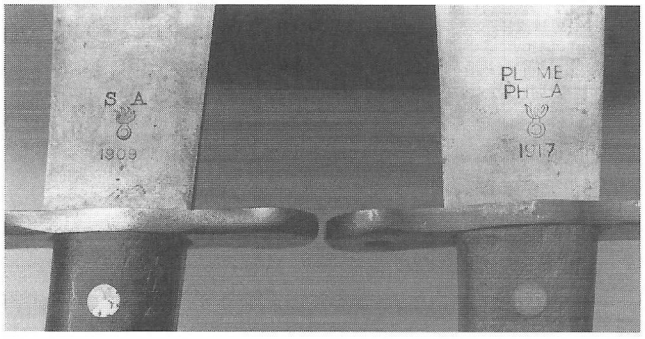
Model of 1909 Bolo

The first knife officially classified as a bolo and intended for potential use as a combat weapon was the Model of 1909. The M1909 bolo featured a 14" bright finished blade with a sharp tip and a slightly curved walnut handle without finger grooves. The blade was marked on the reverse "SA" (Springfield Armory), "flaming bomb" insignia and the year of production. The obverse was marked "US" above a serial number.

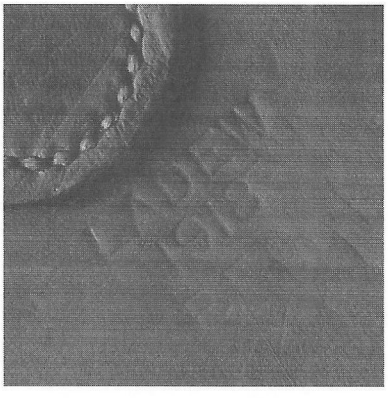
The M1909 bolo was issued with a heavy brown leather scabbard with a chemically blued brass throat and a long belt loop riveted on the back. A metal stud protruded from the throat and mated with a hole in the bolo guard to help secure it to the scabbard. Three minor variations of the scabbard exist differing in whether or not a thin brass ring or brass eyelet was attached to the tip. The M1909 bolo scabbard was marked on the back with the name of the maker (Rock Island Arsenal), the year of production and the initials of the inspector.

Springfield Armory manufactured a total of 17,540 M1909 bolos between 1909 and 1915, and the weapon remained in inventory all through the First World War.

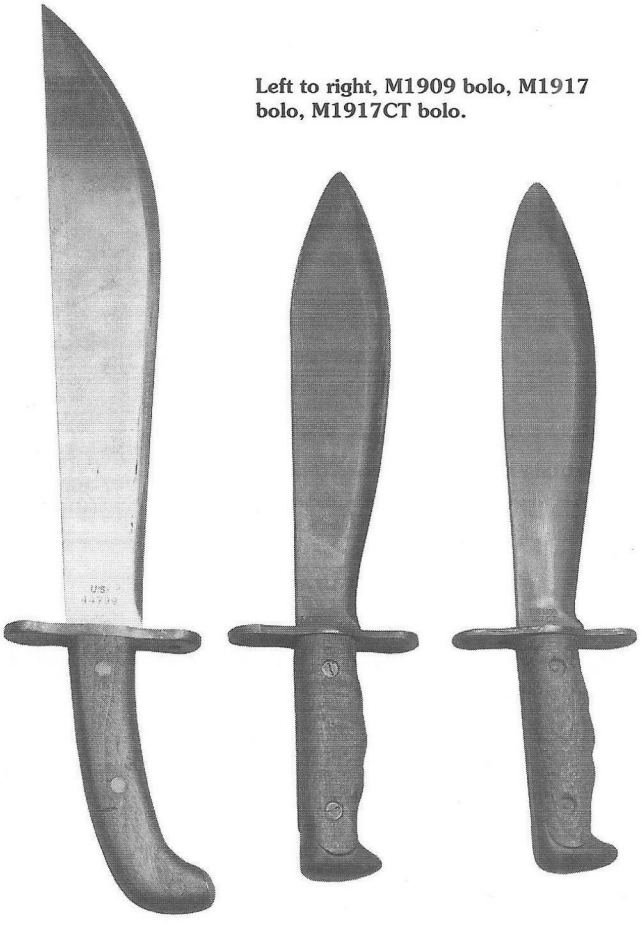
The M1909 bolo was ordered back into production soon after America's declaration of war. However, Springfield Armory was too burdened with other projects to resume production of the M1909 bolo, and the civilian firm of Fayette R. Plumb of Philadelphia was granted a contract to manufacture the M1909 bolo. The bolos made by Plumb were quite similar to the Springfield-made items but were not as well crafted. The workmanship of the blades was a bit lower than the armory-made products, and the walnut handles were noticeably less well finished. The blades of the



Left, blade markings on M1909 bolo manufactured by Springfield Armory. This is a very early example made during 1909, the first year of production. Right, typical blade markings on M1909 bolo made under contract by Fayette R. Plumb Co. of Philadelphia in 1917.



Manufacturer's marking on World War I M1909 bolo scabbard. Most examples of this vintage were marked "Ladew" as on this specimen and dated "1917" or "1918". Faint inspector initials may be seen under the "1918" date. Rock Island Arsenal also produced a number of M1909 bolo scabbards, primarily prior to WWI.



Left to right, M1909 bolo, M1917 bolo, M1917CT bolo.

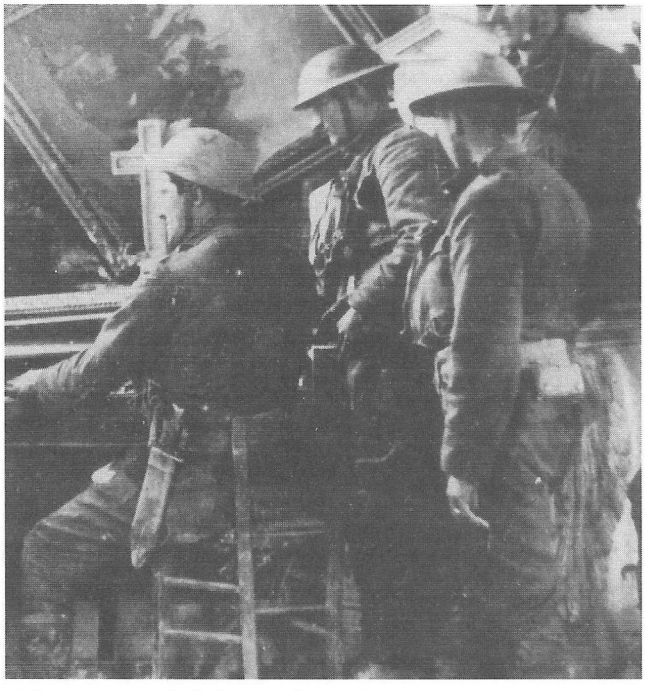
commercial contract bolos were marked on the reverse "Plumb (over) Phila (over) "flaming bomb" (over) year of production ("1917"). The obverse was stamped "US" over the serial number. As stated, Springfield Armory did not manufacture any M1909 bolos after 1915.

Unlike the prewar variety, few, if any, scabbards for the 1917-production bolos were produced by Rock Island Arsenal. Most were manufactured by a civilian contractor and marked "Ladew" on the back along with the year of production and inspector initials. The Ladew-made scabbards were essentially equal to the RIA scabbards in configuration and workmanship.

Over 58,000 M1909 bolos were manufactured by Plumb. All are believed to have been made in 1917, as no 1918 dates have been observed on these bolos.

M1910, M1917 and M1917CT Bolos

A year after adoption of the M1909 bolo, another variety of bolo was standardized by the United States military for field and combat use. The Model of 1910 bolo was a slightly more compact weapon than the M1909, although both were intended for the same purposes. The M1910 had a shorter $10\frac{3}{8}$" blade with a walnut handle having grasping grooves. As was the case with the M1905 bayonet, the guard, hilt and about $\frac{3}{16}$" of the blade were blued to retard corrosion under the grip and the balance of the blade was finished bright. A few late examples may be observed



U.S. troops in shell-damaged French church during WWI. Note the M1910/1917 bolo on the belt of the Doughboy seated at the organ. (U.S. Army Military History Institute)

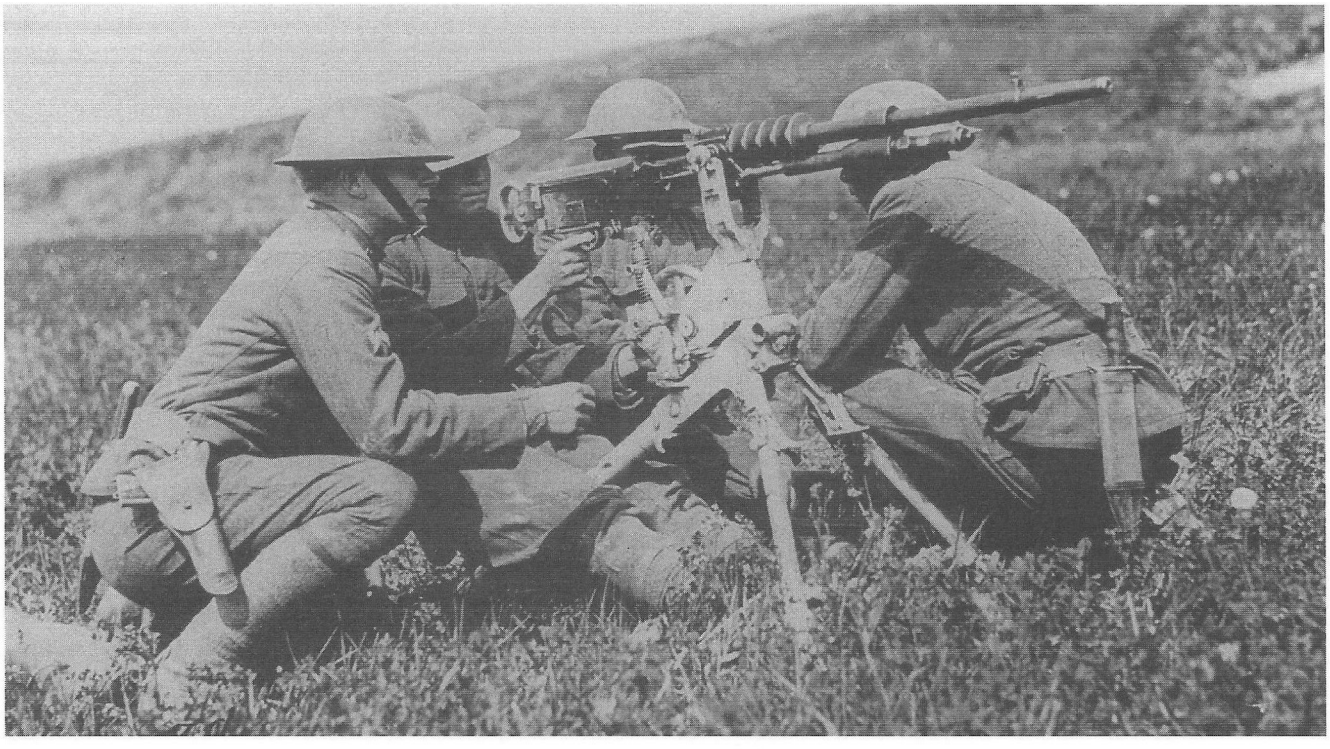
with blued blades. The blade was marked "SA", "flaming bomb" and the year of production on the reverse with a "U.S." and serial number stamped on the obverse. A spring-loaded catch behind the guard secured the bolo to the scabbard.

The M1910 bolo was issued with a scabbard having a wooden body covered with canvas webbing and a leather tip. The scabbard was fitted with cartridge belt hooks. Most, if not all, of the scabbards issued with the M1910 bolo were manufactured by Rock Island Arsenal.

Springfield Armory manufactured 59,095 M1910 bolos between the years 1910 and 1918. As was the case with all weapons produced by the National

WWI M1917CT bolo in limited-issue sheet metal scabbard.

WWI-production M1917 bolo in standard scabbard.



U.S. Army Hotchkiss machine gun crew of Company A, 2nd Brigade machine gun battalion at Little Froissey, France, May 10, 1918. The crewman at the far right has what appears to be a non-standard bolo in a M1910/M1917 scabbard on his belt. Close examination will reveal that the crewman at the far left also has M1910/M1917 bolo attached to the rear of his belt. (U.S. Army Military History Institute)

Armory at Springfield, the M1910 bolo was a well-crafted and finely finished weapon.

As with the M1909 variety, the active involvement of the United States in the First World War resulted in a need for additional M1910 bolos. Since Springfield Armory was unable to increase bolo production, contracts were given to civilian firms for production of the weapon. In order to speed manufacturing time, some changes were incorporated in the original M1910 bolo design. The most significant of these changes was the elimination of the push-button scabbard catch. All metal parts were finished in a very dark parkerizing, and the wooden grips were not as finely finished as the SA-made bolos. These changes resulted in the bolo being designated as the "Model of 1917" rather than the Model of 1910. Dimensionally, the M1917 bolo was essentially identical to the M1910 variant.

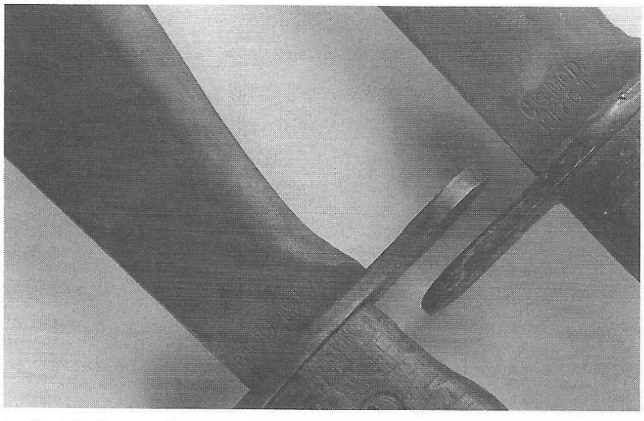
After the M1917 bolo was in production for a while, the design was again modified to speed production and reduce costs by welding the pommel to the tang. This did not materially affect the weapon's utility and enabled the bolo to be manufactured faster and cheaper. This final variant was designated as the "M1917CT." It was functionally identical to the M1917 bolo, and both types were considered totally interchangeable in service. M1917/1917CT bolos were produced by Fayette R. Plumb, American Cutlery Co. and Bartlett Edge Tool Co. The blade was stamped with the model designation on one side (i.e., "U.S. MOD 1917") and the name of the maker and year of production on the other.

Both the M1917 and M1917CT bolos were issued with the same type of scabbard initially produced for the M1910 bolo. Some were made by Rock Island Arsenal, but large numbers were manufactured by several civilian firms including "A-K Co.," "Fred Medart Mfg. Co." and "Brauer Bros." The manufacturer markings were stamped on the back of the leather tip along with the year of production. The most commonly encountered variety today is the "Brauer Bros." scabbard dated "1918".

A stamped steel scabbard with an attached leather hanger and cartridge belt hooks was also produced in fair numbers for use with the M1917/1917CT bolos. The metal scabbard was painted green and marked on the back "U.S.", the initials of the maker and the year of production. All examples noted were made by "LF&C" (Landers, Frary & Clark) in 1918. It has been theorized that these scabbards were issued for Marine Corps use, but there is no known evidence to support this assertion.

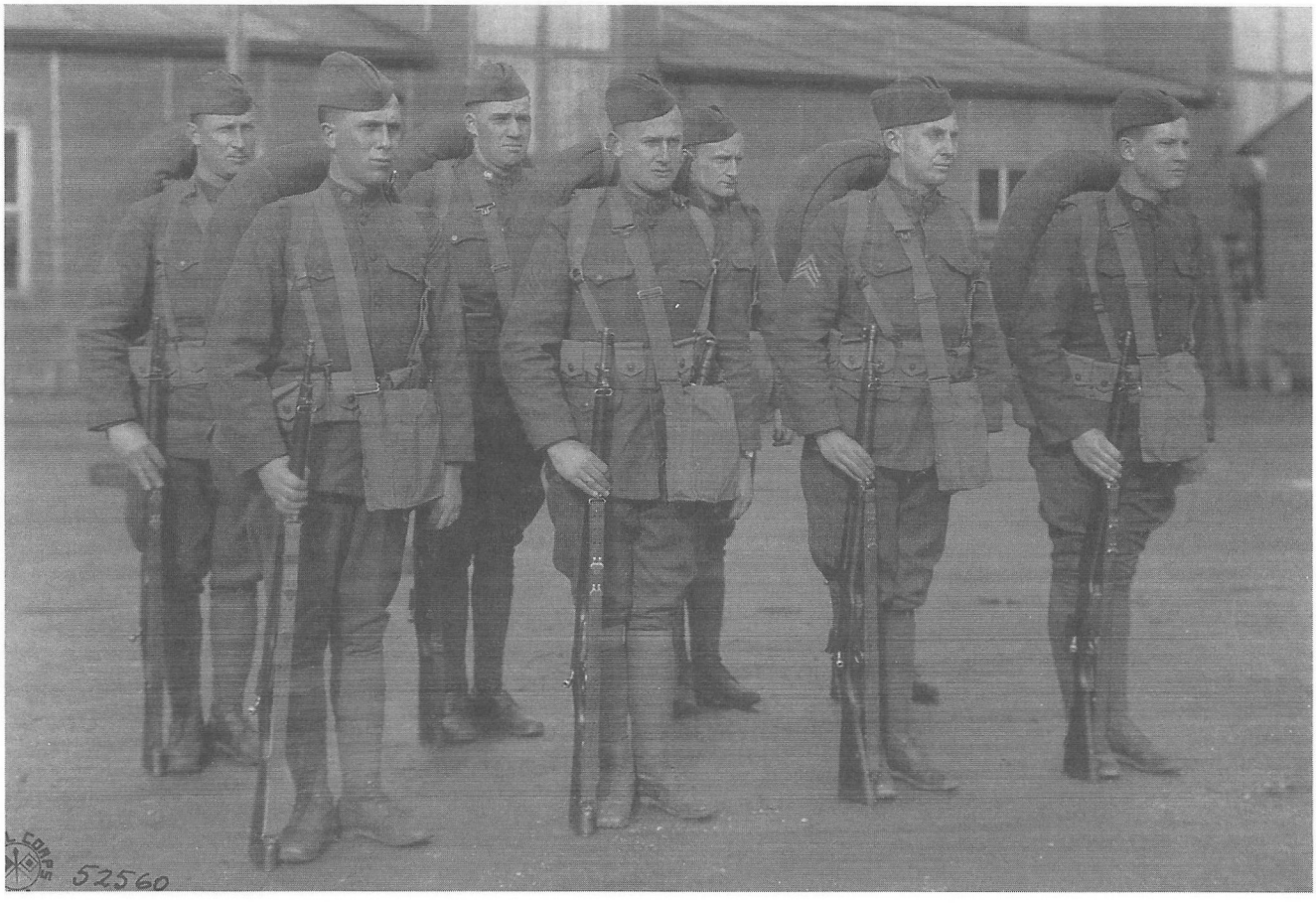
Both types of bolos (the M1909 and M1910/1917/1917CT) saw rather wide issue to the AEF. Machine gun units were issued relatively large number of bolos for use in cutting brush for fields of fire and similar duties. A number of bolos were also in the hands of infantrymen, and they could be useful and quite deadly weapons for trench combat. Judging from contemporary photographs, the M1910/1917 variant was much more commonly seen in the hands of Doughboys than the M1909 bolo.

A number of instances where bolos were used with deadly effectiveness by American troops have been recorded. One of the more famous passages regarding



Left, blade markings on WWI production M1917 bolo. Right, M1917CT bolo. Very dark finish on the blade and light stamping often makes these markings somewhat indistinct.

American soldiers of the 119th machine gun battalion, 32nd Division, sketching a map at Rougemont, France, May 29, 1918. The soldier sketching on the table has an empty bolo scabbard attached to his belt. (National Archives)



(above) U.S. Infantry squad in "marching order" with overcoats and packs at the Embarkation Center, LeMans, France. Note that the Doughboy, front row, second from left, has a M1910/1917 bolo on his belt behind his gas mask case. (National Archives)

the bolo's potential as a combat weapon was related by Laurence Stallings in *The Doughboys* which describes the use of a bolo by a black American soldier, Private Henry Johnson. As stated in the book:

(Private Johnson)...secured a bolo knife and a whetstone some time before he entered the lines. He honed the double edges upon the weapon capable of splitting a cat's whiskers with a feather's blow.

Once the unit engaged the enemy, Johnson used his bolo with telling effect as described in the following passage:

...Private Johnson now had time to unsheathe his bolo... The bolo went through the pillbox cap the German raiders always wore, through the skull and into his throat... As Johnson turned (another) German came at him, firing a Luger pistol. When Johnson was hit, the bullets drove him to his hands and knees. Johnson came up between the German's legs and disemboweled him...

Stallings goes on to state the following regarding the commanding officer of Private Johnson's unit:

Major Little never forgot the thrill of seeing his Harlem boys loosen the bolos in their sheaths the first day of the Argonne-Meuse offensive.

While the bolo could, indeed, be a fearsome

U.S. troops of the 32nd Division equipped with French rifles, grenade launchers and automatic rifles. Note that the soldier at the right has a M1910/1917 bolo attached to his belt.
(U.S. Army, courtesy Konrad F. Schreier, Jr.)

combat arm, like most edged weapons it was more often used as a tool than as a weapon. Nevertheless, whether it was used to clear brush, sharpen tent pegs or cleave a German's skull, the bolo was a very useful item for the Doughboy to have on his belt.

The M1909 bolo seems to have dropped out of widespread use soon after the conclusion of the First World War. Although no bolos were made after 1918, the M1917 bolo (and variants) remained in inventory at least into the early days of WWII. However, few were issued after WWI.

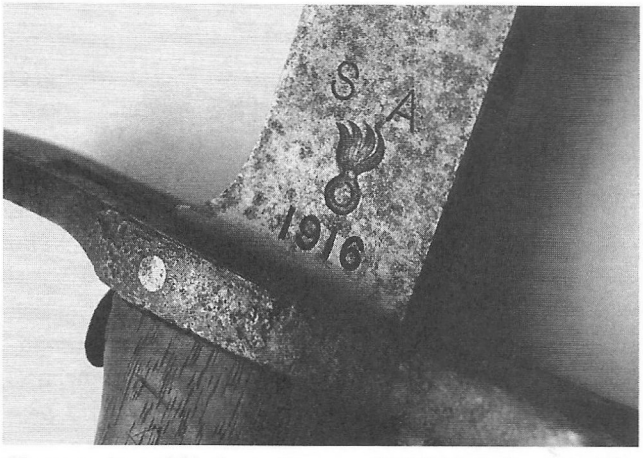
M1915 Bolo-Bayonet

As previously mentioned, beginning around the turn of the century, some experimentation was done on a combination bayonet and bolo. It was believed that a combination weapon of this sort would enable a soldier to carry a one-edged weapon that could function as either a bayonet or a hand-held bolo.

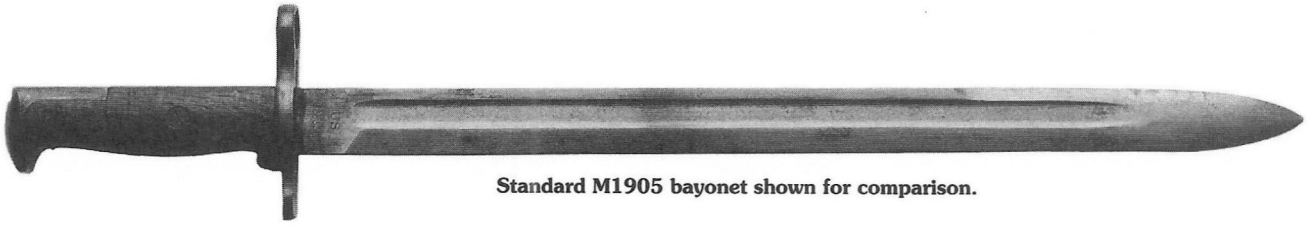
Two types of combination bayonets were produced for the Krag and each proved to be unsatisfactory. The replacement of the Krag rifle by the '03 resulted in the emphasis being shifted to a combination bayonet/bolo for the new rifle. Several prototype combination bayonets/bolo designs for the '03 rifle based on the M1909 bolo and M1910 bolo were fabricated, but none were placed into production.

In 1915, a combination bayonet/bolo was approved for production by Springfield Armory for use with the M1903 rifle. This weapon featured a $15^{13}/_{16}$" bright finished blade with walnut grips and a hooked pommel. As was the case with the M1905 bayonet, the hilt and a small portion of the blade were blued in order to retard corrosion under the grips. The M1915 bolo bayonet attached to the rifle in the same manner as the M1905 bayonet. The obverse ricasso was stamped with "U.S." over the serial number, and the reverse ricasso was marked "S.A.", a "flaming bomb" insignia and the year of production (i.e., "1916"). The markings were the same size and format as found on the standard-issue M1905 bayonet. The bayonet was issued with a leather scabbard having a wide belt loop.

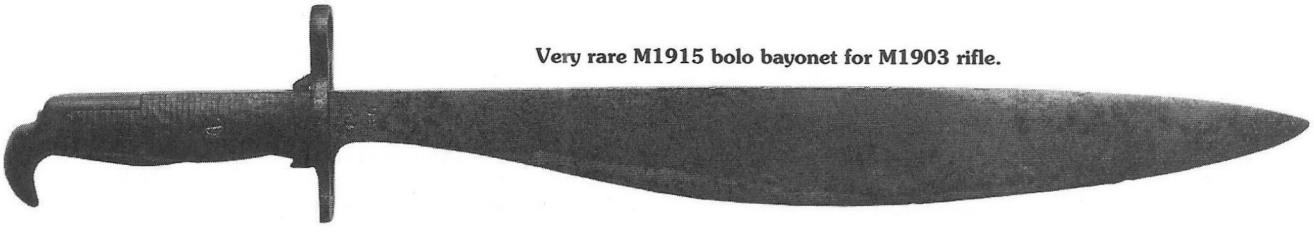
Springfield Armory manufactured 3,200 M1915 bolo bayonets in Fiscal Year 1916 and 2,804 in Fiscal Year 1917. Most, if not all, examples were actually produced in calendar year 1916. There is no indication that the weapon was widely issued to American troops before, or during, the First World War. Apparently, most were destroyed after being withdrawn from service and, surviving examples are exceedingly rare today. Although not an item of regular issue to the AEF, the M1915 bolo bayonet is a very interesting (and valuable) collectible and a good example of an idea that sounded fine in theory but didn't work in practice. The standard bayonets and bolos were much more practical than a combination weapon such as the M1915 bolo bayonet.



Close-up view of blade markings on M1915 bolo bayonet. The year "1916" is the date of production and "SA" indicates manufacture by Springfield Armory.



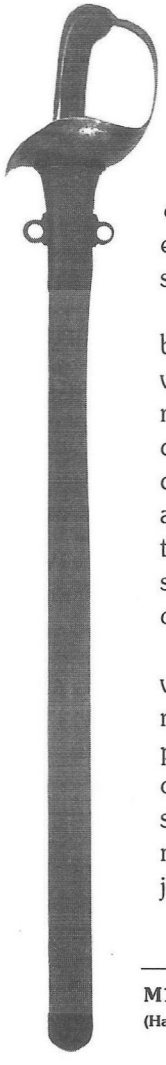
Standard M1905 bayonet shown for comparison.



Very rare M1915 bolo bayonet for M1903 rifle.

While often overshadowed by the bayonet and trench knife, the bolo was a widely used and quite useful tool and weapon of the American Doughboy of the First World War. A presentable example is a fine acquisition for a collection of WWI or U.S. martial edged weapons.

Model of 1913 Saber

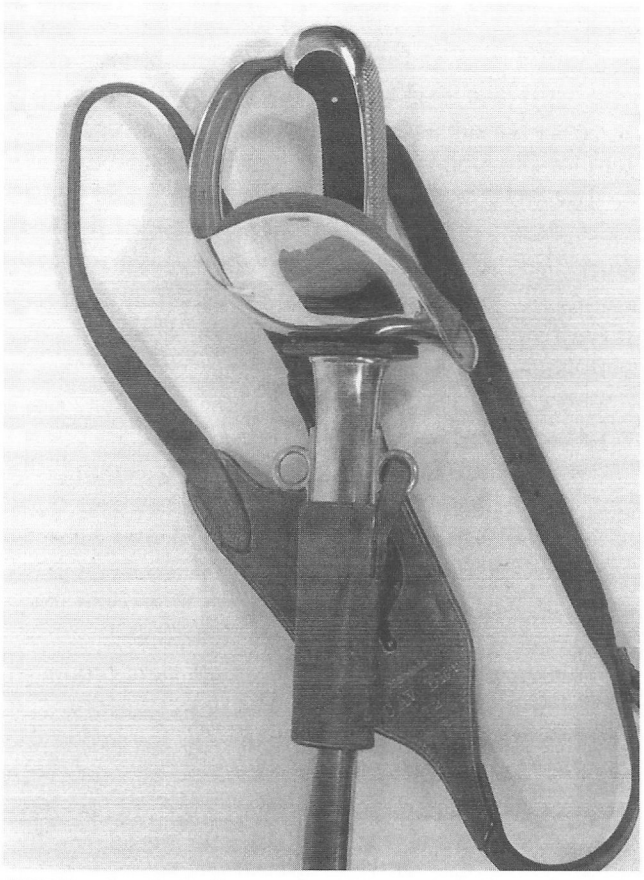


The Model of 1913 was the last standard-issue cavalry saber adopted by the U.S. Army. The weapon was designed by Lt. George S. Patton, Jr. who was a gold medal winner in the 1912 Olympics. Patton was also the U.S. Army's first "Master of the Sword." The design was originally tested in 1911, and a modified version with a straight blade was officially adopted in 1913.

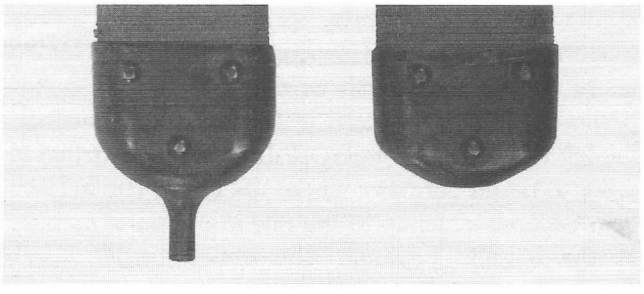
The M1913 saber had a bright finished blade approximately 35⅓" long. The handle was about 6⅓" in length, and the grip was made of hard black rubber. The guard was constructed of black sheet metal. An "officer's model" M1913 saber featuring an attractive nickeled finish was also manufactured. The accompanying officer's model scabbard was made of metal rather than the canvas-covered, standard-issue pattern.

The standard scabbard consisted of a wooden frame covered by webbing. The mouthpiece and tip were metal. The original pattern scabbard had a projection on the end of it that served as a pup tent pole. Later versions dispensed with this projection, and many of the earlier scabbards had the projection ground down.

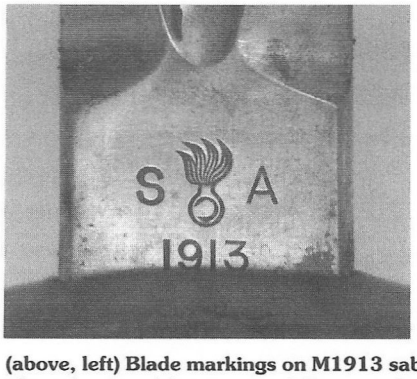
M1913 cavalry saber, in scabbard. (Hayes Otoupalik collection)

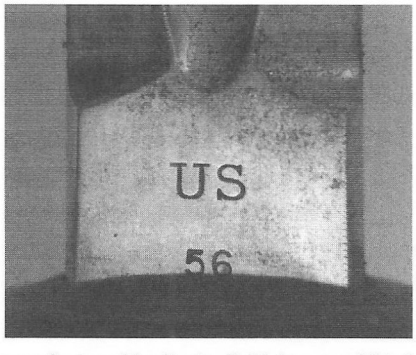


M1913 saber in leather carrier. This example is an "officer's model." (Hayes Otoupalik collection)



M1913 saber scabbard (left) with "tent peg" projection on bottom; (right) Standard scabbard. Most of the earlier "tent peg" scabbards had the projection ground off. (Hayes Otoupalik collection)



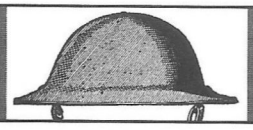


(above, left) Blade markings on M1913 saber manufactured by Springfield Armory. This is an early example made in 1913, the first year of production. (above, center) Reverse view showing "US" markings. (above, right) Blade markings on M1913 saber made by Landers, Frary & Clark during WWI. (Hayes Otoupalik collection)

From the time of its adoption into the First World War, the M1913 saber was made by Springfield Armory. During the war, the saber was made under contract by the commercial firm of Landers, Frary & Clark. The initials of the maker ("SA" or "LF&C"), an ordnance "flaming bomb" and the date of production were stamped on the blade near the handle.

The M1913 saber was carried by many of the cavalry troops deployed for duty along the Mexican border in 1916 but was reportedly withdrawn prior to actual combat engagements. None of sabers were utilized for combat purposes overseas during WWI. The M1913 saber remained standard issue until it was dropped from service in April of 1934. Although not used in combat, the M1913 saber is noteworthy, as it was the last standard-issue combat U.S. Army sword.

Collector Notes



BAYONETS

The collecting of U.S. martial edged weapons was only marginally popular until the last fifteen or twenty years. There has always been a hard-core group of martial edged weapons collectors, but they were vastly outnumbered by collectors of firearms. With a few exceptions, most examples of U.S. martial edged weapons were not extremely costly. However, the fairly recent explosion of interest in these weapons has resulted in skyrocketing prices. While all U.S. martial edged weapons have experienced noticeable price increases in the past five years or so, the most dramatic changes will be found in high-quality bayonets and scabbards.

M1905 Bayonet

Original M1905 bayonets and scabbards have increased in desirability and price to a very great degree recently. The most coveted examples are pre-1918 bayonets retaining the original bright blades. Since most of these bayonets were parkerized and/or cut-down in length during WWII, surviving unaltered examples are avidly sought by collectors today. The original blued and parkerized examples made circa late 1917 into 1918 are certainly more desirable (and much less common) than the WWII-modified examples but do not bring as much on the market today as the original bright-bladed M1905 bayonets. The fact that the earlier examples can be displayed equally well with pre-WWI as well as First World War vintage '03 rifles makes them popular today. There does not seem to be any difference in value between Springfield Armory and Rock Island Arsenal M1905 bayonets in comparable condition and degree of originality, although the latter are much less common.

Some of the M1905 bayonet blades that were parkerized after WWI have had attempts made to remove this later finish. Normally, this was done by polishing the blades down to the bare metal. If this work is done really well, it might be hard to spot with just a cursory glance. However, in most cases, the polishing will make the original blade markings less distinct and will slightly alter the contour of the blades. Also, when the bayonets were overhauled in WWII, the original walnut grips were normally replaced by plastic grips. Replacement walnut grips are quite hard to come by today. If a new replacement pair were installed, the condition of the grips would not match the wear found on the polished blade. It should always be remembered that the metal and grips should exhibit consistent wear patterns. A well-worn blade with pristine grips is a sure sign something is amiss.

The early, unmodified leather M1905 bayonet scabbards are fairly scarce on the market today. They are popular with collectors of pre-WWI '03 rifles but are not correct for display with First World War rifles. The modified M1905 scabbards are a bit more common than the unaltered variety and are correct for WWI (and later) '03s.

The most popular type of bayonet scabbard with collectors today is the M1910. Decent examples have never been extremely common since most saw wide use during WWI and WWII and large numbers were worn out and discarded. The increased collector demand has resulted in M1910 scabbards becoming quite scarce. Prices for a scabbard "on the loose" can often be as much (or more) than for a M1905 bayonet in comparable condition. Fakes are not yet a problem, but as the demand and price continue to climb, this may be a real possibility. The scabbards were normally unmarked. The M1910 scabbards manufactured in WWII will exhibit a dark, olive green web cover, while the First World War (and earlier) scabbards typically had khaki canvas. The WWII dark green canvas scabbards would not be correct for display with a First World War vintage '03 rifle. The primary determining factor regarding price of a M1910 scabbard is condition. Many are well worn with frayed or ill-fitting covers. Again, the general condition of the scabbard should match that of the bayonet.

M1917 Bayonet

Probably the most dramatic rise in value for U.S. bayonets of the WWI period is found in prices for the M1917. For many years, these bayonets went begging on the market. Collector interest in M1917 rifles and trench guns was minimal until the last five years or so. The rapid increase in collector popularity of trench guns has resulted in nice M1917 bayonets and scabbards rising in price proportionally. The recent surge in collecting M1917 rifles only added to the demand for collectible bayonets.

While far from rare, decent M1917 bayonets and scabbards have gotten to be much harder to find recently, and prices have risen fivefold (and more) in the past few years. The majority of M1917 bayonets found today were refurbished during WWII. These can normally be identified by the dark gray parkerizing on the blades and fairly indistinct markings. These are less desirable and less valuable than the original, unaltered bayonets. The unaltered bayonets will typically have a two-tone finish with the hilt area (and a small portion of the blade blued) and the balance will have a phosphate finish. All markings will be clear and sharp.

M1917 bayonets made by Winchester will normally bring somewhat more than the bayonets made by Remington. This is due to the smaller number made and the allure of the Winchester name. The bayonets made under British contract with the original markings defaced and "U.S." markings over-stamped are inter-

esting variants. However, given comparable condition, they do not sell for any more than the standard U.S. Remington variety and may even bring a bit less.

The "Type 2" M1917 bayonet scabbard (with rolled metal tab extension) is the most commonly encountered. The earlier "Type 1" (with separate leather hanger) is not rare but is definitely seen less often than the second variant. Both types are usually priced about the same. As stated, the general condition of the scabbard should approximate that of the bayonet. The plastic M1917 scabbards were made in late WWII (or in the 1960s) and are totally incorrect for display with a WWI-vintage rifle or trench gun.

Krag Bayonet

U.S. Krag rifles have experienced a noticeable surge in collector popularity, as have the bayonets. The first year (1894) production bayonets had blued blades, but the balance of the production was made with bright finished blades. Any U.S. Krag bayonet would be technically correct for display with a M1898 Krag rifle. Krag bayonets have risen in price rather dramatically during the past two or three years, but decent examples are still not normally too difficult to find.

The standard metal Krag bayonet scabbard is unmarked, and any example would be suitable if the condition was similar to that of the bayonet.

Ross Bayonet

Mark I Ross bayonets with U.S.-surcharged grips are not particularly common but do show up from time to time. Given the relatively low collector interest, prices are normally reasonable. Other than the U.S. markings, the major determining factor regarding value is condition. Since many of these weapons saw little if any use, finding a decent example is not normally a daunting task. The most desirable types will evidence little sharpening, and the blades will have a uniform finish without discoloration and other signs of corrosion.

A U.S.-surcharged Ross bayonet should be accompanied by the proper scabbard with the same type of martial markings. As is always the case, the general condition of the scabbard should be similar to that of the bayonet.

Mosin-Nagant Bayonet

Identifying the bayonets used with U.S.-procured M1891 Mosin-Nagant rifles is pretty straightforward. The bayonets are marked with a circled "R" and a serial number. Unlike the American M1905 bayonets, it is probable that the serial number of the rifle and bayonet were initially intended to match, since they were to be kept together as a unit.

In actual practice, however, the bayonets and rifles were often separated, and matching numbers are not common. While a few bayonets of this type have been reported with a "flaming bomb" insignia, this marking was not applied to the overwhelming majority of Mosin-Nagant bayonets acquired by the United States.

The condition of the blued finish on the bayonet should match that of the rifle, as a pristine bayonet wouldn't be found on a well-worn rifle. There were no scabbards issued with the Mosin-Nagant bayonets.

British Pattern 1907
Mark I SMLE Bayonet

British military weapons, including bayonets, have never been wildly popular in this country. Examples are First World War vintage Pattern 1907 Mark I bayonets in decent condition are not normally hard to find, and prices are usually rather modest. A collector seeking an example should be sure to determine that the bayonet is of the proper vintage. Since the blades were marked with the month and year of production, this is not difficult. There were no distinguishing characteristics peculiar to the P1907 bayonets issued to American troops training with the British.

Most P1907 bayonets will be found complete with their original scabbards. The canvas belt hangers are sometimes missing and can be a bit tough to locate. If a bayonet is encountered with a missing scabbard, it would be best to pass on the purchase unless the price is extremely attractive. Finding the proper scabbard "on the loose" is normally harder than finding a complete set.

All of the U.S. bayonets of the First World War period are desirable collectibles. As stated, prices have risen rather dramatically in the past few years, and such items should continue to be good investments and interesting additions to a collection for years to come. The proper bayonet makes a great companion to a rifle in a collection. Any U.S. military rifle with a bayonet affixed is an eye-catching combination when displayed.

TRENCH KNIVES

M1917/1918 Trench Knives

The M1917/1918 trench knives are easy to identify, and evaluation is normally not too difficult. The only significant difference between the M1917 and M1918 variants is the configuration of the metal knuckle-bow. There is a somewhat scarce variant of the M1917 knife that is identified by an extra pyramid-shaped knob situated on the guard almost parallel to the blade. Collectible examples of this variant will bring a premium over the standard knife without the extra knob.

Although production totals varied, the M1917/1918 trench knives made by all manufacturers are normally priced about the same given comparable condition. There does not seem to be any discernible price difference between the M1917 and M1918 variants.

Some of M1917/1918 trench knives may be found today with blades shorter than the original 9" length. This is due to blade tips that were broken and the ends re-shaped. Any alteration of this type severely devalues the knife for collecting purposes.

Fake M1917/1918 trench knives have not been a problem. However, since prices are steadily rising, this possibility always exists, and any example offered for sale that differs from the known originals should be examined very closely.

Some M1917/1918 trench knife scabbards may be encountered today that are broken and/or badly deteriorated. Obviously, such scabbards are not good candidates for collecting. However, even a poor scabbard is better than no scabbard at all. Again, bogus scabbards of this type have not yet been observed, but this may change in the future.

Once quite common, the M1917/1918 trench knives are becoming harder to find and more expensive with each passing year, and this trend will surely continue.

M1918 Mark I Trench Knife

While fakes have not been a problem with the M1917/1918 trench knives, the opposite is true regarding the M1918 Mark I trench knife. This knife has always enjoyed some collector popularity due to the impressive brass knuckle handle with bold markings.

The most commonly encountered variant of the M1918 Mark I is the LF&C-made variety. Examples made by the other U.S. manufacturers are extremely hard to find and will normally bring a substantial premium over the LF&C knives. Interestingly, the French-made "Au Lion" M1918 Mark I trench knives usually sell for about the same, or perhaps a bit less, than the more common LF&C variant. This is probably not warranted because these knives were made in smaller numbers and were much more likely to have seen actual use during WWI than the U.S.-made knives. There were a couple of minor variants found in the French-made knives consisting primarily of grooves on either side of the handle and

the size of the markings. These variations do not seem to have any impact on the value or desirability of the knives.

As originally manufactured, the American-made M1918 Mark I trench knives had blue/black blades and chemically blackened handles. Some subsequent owners have removed this finish in an attempt to "dress up" the knife and reveal the bright brass underneath the blackened finish. This may "improve" the appearance to a non-collector, but it devalues the piece quite a bit for collecting purposes. As stated, the "Au Lion" knives were not blackened.

All known M1918 Mark I trench knife scabbards were made by Landers, Frary & Clark (LF&C) and dated 1918. These markings were stamped on the back. Many scabbards are missing one or both of the metal attachment prongs. This has a negative impact on the value of the scabbard but, again, a damaged scabbard is better than not having one at all. The scabbard should also be blackened.

There are large numbers of reproduction as well as some fake M1918 Mark I trench knives around today. The difference between reproductions and fakes can be blurry but, generally speaking, the former was not made with any larceny in mind, while the latter were produced solely to defraud unsuspecting buyers. The reproduction M1918 Mark I trench knives are commonly sold in catalogs and at gun shows and are quite easy to identify. The handles are usually marked with a bold "1918" and, sometimes, "U.S." as well. The blades are normally unmarked. The metal scabbards are of a different configuration than either the sheet metal LF&C scabbards or the iron French-made type. The quality of workmanship is rather low and prices very modest. Only the most inexperienced or gullible collector would be fooled by such knives, and sellers almost never make any assertions as to their originality.

Regrettably, some fairly convincing fake M1918 Mark I trench knives have been around for at least twenty-five years. At first glance, the knives look very good and the markings appear almost identical to the originals. Reportedly, many of these fake knives were made in England. Interestingly, the fake knives normally have the common LF&C markings rather than the much rarer (and valuable) markings of the other contractors. Invariably, these knives will be found without scabbards. If one attempts to place an example in an original scabbard, many will not fit because the blade is too wide. It is puzzling why someone would go to the trouble of making a fairly convincing fake but forget to machine the blade to the proper contour. In addition, close examination of the handle will usually reveal some flaws in the metal. Any M1918 Mark I trench knife, particularly without a scabbard, should be examined very closely and, if possible, compared to a known original.

Although not widely issued in the First World War, the M1918 Mark I trench knife is a popular collectible, and prime examples will continue to be good investments.

Any type of U.S. World War I trench knife always attracts the interest of collectors and non-collectors alike. They are visually impressive weapons and can make the brutal reality of war more vivid to one who has never experienced it. Original specimens in nice condition are worthy additions to any collection.

BOLOS

Collins No. 1005 Knife

While not considered rare, examples of the Collins No. 1005 knife can be elusive. The most desirable examples for martial collectors are the green horn handle variants, the knives having "US ED"-marked blades and those with scabbards bearing military unit markings. It should be noted, however, that not all of the Collins No. 1005 knives issued to the military had martial markings added to either the blade or scabbard.

This knife makes an impressive collector item due to the massive and heavy curved blade and the attractive tooled leather scabbard. While not usually cheap, prices are typically much less than for some other more common military edged weapons. Fakes are not a problem, and identification is quite easy. Any nice example is a fine addition to a collection.

M1904 Hospital Corps Knife

Many collectors consider this to be one of the most attractive U.S. military edged weapons ever produced. The fact that the knife was not designed or intended as a combat weapon may limit its desirability in the eyes of some, but the item is popular with a large segment of military edged weapons collectors.

While not rare, fine-conditioned (or better) examples often bring a surprising amount on the market today. The relative scarcity, flawless workmanship and impressive appearance all add to the knife's desirability. Fakes have not been reported but, as always, this does not mean that one should be oblivious to the possibility.

Most examples of the M1904 Hospital Corps knife seen today are complete with their scabbards. If a specimen without a scabbard is offered for sale, the price should certainly be discounted, as finding the proper scabbard "on the loose" will be difficult. The several minor scabbard variations are all worth about the same, assuming comparable condition.

The M1904 knife is often overlooked when considering the edged weapons of the WWI period. However, it is an interesting and valuable collectible and a worthwhile acquisition.

M1909 Bolo

Like all the edged weapons discussed previously, the M1909 bolo is becoming harder to find and more expensive. The Springfield Armory-made bolos normally bring a premium over the examples produced by Plumb. Many of these bolos will be found in less-than-pristine condition, as they were subjected to hard use. Other than the manufacturer, the degree of sharpening and corrosion (if any) on the blade will be the determining factor regarding price. A few fakes have been reported but are not yet a real problem. The configuration of the bolo and the markings should be examined very closely. It must be noted that the Springfield-made blades will have sharp markings, but the Plumb blades will often be found with somewhat indistinct markings.

The M1909 bolo scabbards made by Rock Island Arsenal will often bring a slight premium over the Ladew-made scabbards, but this difference is not normally great. None of the minor scabbard variations should have any discernible impact on price. It should be remembered that a scabbard made by Ladew and dated "1917" would not be proper if one wishes to display a pre-WWI Springfield Armory M1909 bolo. Most collectors would rather have a RIA scabbard with their SA bolo and a Ladew scabbard with their Plumb bolo. In actual practice during the war, however, the scabbards and bolos were usually mixed, and any type would be technically correct.

M1910 Bolo

The M1910 bolos made by Springfield Armory are the most desirable and normally the most expensive of the M1910/1917 series. They will usually sell for more than a comparable M1917/1917CT bolo. The identifying characteristics are the Springfield Armory markings along with the bright blade and the inclusion of a push-button scabbard catch. The earlier bright-blade variety and the later blued version seem to be worth about the same, although the latter are less commonly seen. All versions dated prior to 1917 should have bright blades, and any examples with another type of blade finish are not totally original.

The M1910 scabbards made by Rock Island Arsenal are less commonly found

than the Springfield-made bolos. Some M1910 bolos will be found with WWI-dated Brauer Bros. (or other makers) scabbards. Obviously, a bolo dated prior to 1917 was not originally issued with a 1918-dated scabbard. Although technically correct for WWI service, such a mis-dated combination would not be worth as much as a Springfield Armory bolo and a Rock Island Arsenal scabbard to a collector.

M1917/1917CT Bolos

The M1917 and M1917CT seem to be found in about equal numbers today, and values are normally the same for comparable specimens. Condition will range from new to very well used. Even quite nice examples will often have somewhat indistinct blade markings. This does not necessarily mean that such bolos have been refinished, although that possibility always exists. Some mint-conditioned examples have much of the blade finish marred due to tight fitting scabbards. This will devalue the bolo depending on the degree of marring.

All of the scabbards made by the civilian firms have about the same value, although the Brauer Bros. examples are the most common. As is the case with the other edged weapons discussed, the condition of the scabbard should be very close to that of the bolo. That having been said, the scabbard often bore the brunt of wear and tear while protecting the blade. However, the handle of the bolo would receive some wear in such instances so a totally pristine knife would not be found in a very worn scabbard. Of course, the reverse is even more apparent. A new scabbard would not be proper for a well-used bolo even if the type and vintage were proper. This is true for all types of edged weapons. Seemingly minor factors can be quite important when attempting to determine the originality of a scabbard and edged weapon combination.

M1915 Bolo-Bayonet

This is one of the rarest and most valuable U.S. martial edged weapons, and original examples are seldom offered for sale. Few examples extant are in pristine condition, and most are well used, but any original specimen is extremely valuable. Interestingly, despite the high price and extreme rarity, few fakes have been reported. However, the price of the weapon is such that one must be extremely cautious when considering an example for purchase. The configuration of the blade, the crispness of the markings and the overall workmanship should all be examined closely.

Original scabbards are even rarer than the weapon, and few examples have survived. An original M1915 bolo-bayonet can be a centerpiece to a '03 or U.S. martial edged weapons collection. If you find one, be prepared to open your checkbook wide! The M1915 bolo-bayonet is rarely thought of as a weapon of the First World War, since the weapon saw little, if any, use during the war.

Model of 1913 Saber

Model of 1913 sabers are still relatively available at fairly reasonable prices. The pre-WWI Springfield Armory examples will normally bring a noticeable premium over the WWI-vintage Landers, Frary & Clark swords, assuming comparable condition. The "officer's model" variant usually sells for more than the standard versions, although many collectors of combat weapons may prefer the latter type.

The "tent" peg scabbards are harder to find and more desirable than the later versions without the projection on the end. The condition of the scabbard should approximate that of the sword. Worn and frayed canvas covers decrease the value and desirability, as do cracked or broken rubber grips. Some well-used swords with new replacement grips may be encountered, so be certain that all wear patterns appear consistent. Excessive sharpening, discoloration and nicks on the blade will all decrease the value of examples. In pristine condition, the M1913 saber is a very attractive weapon and will add much color to an early 20th-century U.S. cavalry display.

Handguns

From the time of their introduction until at least the American Civil War, military handguns were often viewed by many nations as essentially secondary weapons. The rifle and bayont were the "real" tools of the infantryman. The first practical repeating handgun developed by Samuel Colt was quickly recognized as a quantum leap forward, and fairly large numbers of such weapons were fielded during the War Between the States. After the war, the latest metallic cartridge revolvers were procured and issued by the U.S. Army, mainly to cavalrymen. The saber was primarily relegated to ceremonial occasions, but the revolver (along with the carbine) was viewed by the U.S. cavalry as an indispensable weapon.

While widely used by many nations for hundreds of years, the unique aspects of the First World War resulted in a renewed emphasis on handguns. After the war bogged down into a protracted trench warfare struggle, the belligerents began to use handguns with increasing frequency. As stated in a 1920 *Harper's Pictorial* article on the subject:

With the war degenerated into a desperate struggle at short range for the possession of very undesirable sets of mud-holes, the pistol came into a field of usefulness from the military standpoint which it has not occupied since cavalry fights were the proper thing...in the melee the rifle is too long to be used with the best effect and a bayonet is no better than its own length plus that of the rifle which holds it...

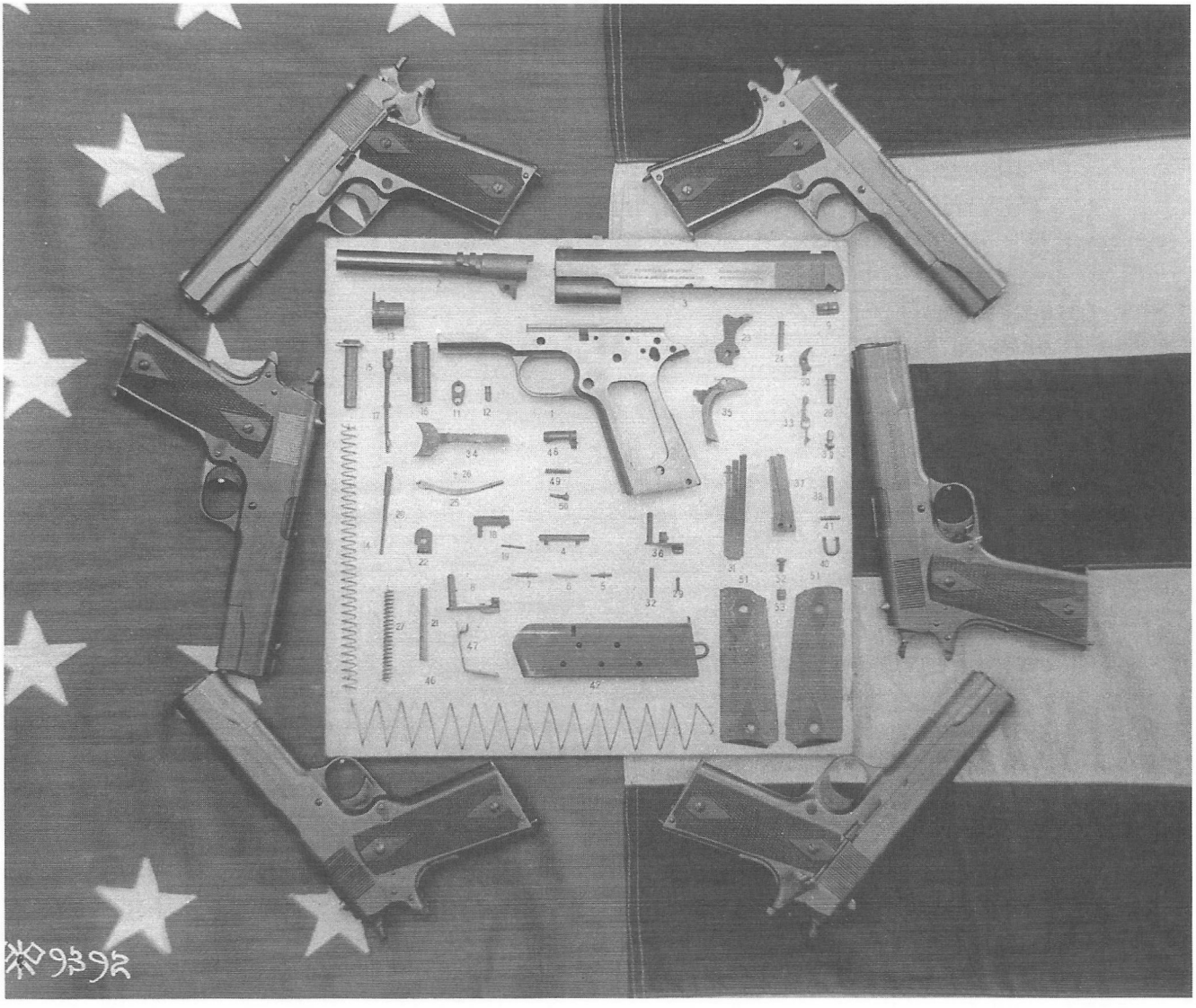
The British Webley and the German P08 ("Luger") saw large-scale production and issue during the war, and the weapons proved to be of value for trench fighting.

M1911 .45 Pistol

In the early 1890s, the United States military abandoned the famed M1873 Single Action Army revolver chambered for the heavy (and potent) .45 Colt cartridge in favor of a double-action revolver chambered for the much lighter .38 "Long Colt" round. The .38 LC cartridge proved to be a miserable failure in the Philippines around the turn of the century, and the U.S. Army searched for a more effective cartridge. Exhaustive testing revealed that a cartridge of less than .44 caliber could not be counted on as a reliable "man stopper." The government recognized that a self-loading handgun would be superior to a revolver for military use, and several designs were evaluated. As an interim measure, some of the old M1873 .45 SAA revolvers were called out of retirement and issued to our troops in the Philippines. In 1909, the Colt firm was given contracts to produce a number of the company's latest pattern large frame double-action revolvers chambered for the .45 Colt cartridge for the U.S. Army, Marine Corps and Navy. These "Model of 1909" revolvers were issued in limited numbers and were infinitely better for combat use than the M1892–1905 series of double-action Colts that were chambered for the puny .38 LC cartridge.

The various tests to determine the best self-loading military pistol design culminated with the adoption of the Colt "U.S. Pistol, Caliber .45, Model of 1911" chambered for the .45 ACP (**A**utomatic **C**olt **P**istol) cartridge. The .45 ACP was a rimless round and featured a heavy 230 grain jacketed bullet moving at a relatively slow 830 f.p.s. The M1911 pistol was designed by the legendary John M. Browning. The pistol was recoil operated and had a detachable 7-round magazine housed in the butt. The weapon weighed 2.47 pounds with an overall length of 8.62". The barrel was 5" long.

The Colt's Patent Firearms Manufacturing Company held the production rights for the weapon. With adoption of the M1911 pistol, the various .38 double-



First World War vintage Ordnance Department photo showing six M1911 .45 pistols on an American flag arrayed around a display board showing the components of the weapon. (U.S. Army Military History Institute)

action revolvers were withdrawn from regular U.S. Army and Marine Corps units and put into storage or issued to the National Guard. In late 1911, M1911 pistols began to come off Colt's assembly line. While a self-loading or semiautomatic design, the M1911 soon became known as the ".45 Automatic" despite the fact that the term "automatic" normally refers to a weapon capable of fully automatic fire (i.e., a machine gun). Nevertheless, this technically incorrect appellation remains in widespread use even today, and is synonymous for the M1911 pistol (and subsequent variants).

When the United States entered the First World War, the M1911 was the standard-issue handgun for all branches of the service. In addition to the pistols made by Colt, Springfield Armory manufactured a total of 25,767 M1911s in fiscal years 1914 (3,030 produced), 1915 (15,359 produced), 1916 (4,966 produced) and 1917 (2,412 produced). At the time of America's entry into the war, there were only some 75,000 M1911 pistols in inventory. Obviously, this was woefully short of the number needed to arm even a fraction of the rapidly expanding AEF.

Colt was the only entity producing the M1911 pistol in the spring of 1917, and the firm was immediately given additional orders for the weapon. However, the increased production at Colt was projected to be far short of the number of pistols needed, and the government sought other manufacturers. Springfield Armory was too burdened with production of the M1903 rifle (and M1905 bayonet) to manufacture the M1911 pistol, so the government looked to the commercial sector. On December 29, 1917, the Remington Arms-Union Metallic Cartridge Company was awarded a contract for the production of 150,000 M1911 pistols.

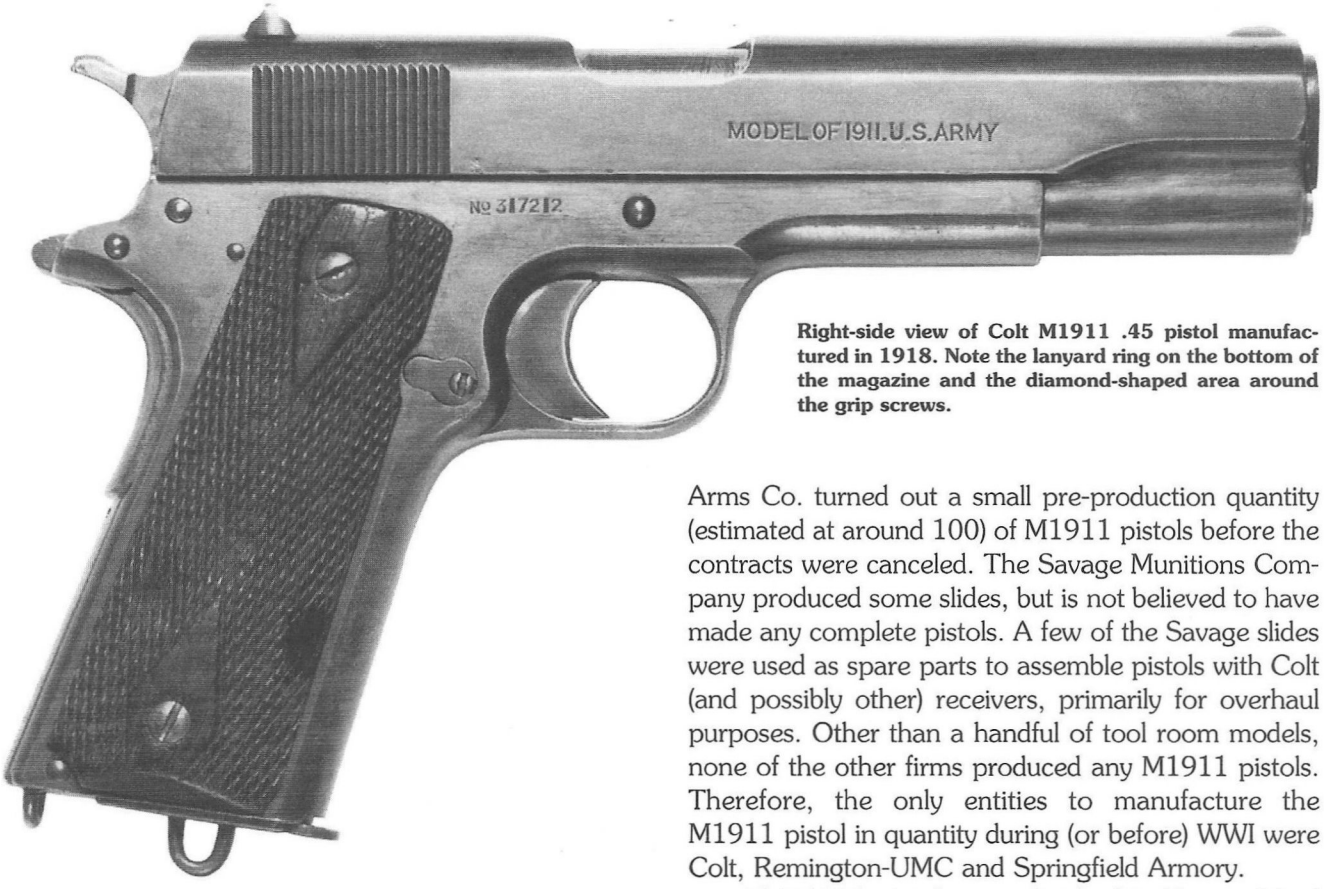
The contract called for a target production rate of 3,000 pistols per day to be achieved as soon as possible. Remington-UMC immediately experienced problems, as the necessary production drawings and specifications were not available. The fact that the pistols produced by Colt and Remington-UMC were required to have interchangeable parts meant that such drawings and specifications were mandatory before mass production could begin. Eventually, a complete set of drawings and specifications was given to Remington-UMC, and the company began to tool up for production. The first M1911 pistols were delivered by the firm in August of 1918. However, prior to the termination of its contract in December of 1918, it was reported that the Remington-UMC was only able to deliver some 13,152 pistols. The company eventually turned out a total of 21,677 M1911 pistols by the time production ceased in early 1919. As can be seen, the vast majority of M1911 .45 pistols fielded during WWI were made by Colt.

Colt did a remarkable job of increasing M1911 pistol production even though the firm was burdened with manufacture of the Vickers machine gun, BAR and other weapons. Daily production went from some 470 pistols in January of 1918 to about 1,000 pistols in May of the same year and almost 2,200 pistols per day by the summer. The average daily output of M1911 pistols during the four months prior to the Armistice was 1,993 units. These totals include the pistols being turned out by Remington-UMC but, as stated, the output by that firm was only a minor percentage of total production. The overwhelming number of M1911 .45 automatics were made by Colt.

Even though Colt did an exceptional job in increasing production of the weapon and Remington-UMC labored diligently to produce M1911 pistols, the combined production by the two plants still fell short of the requirements. Smith & Wesson and Colt were given contracts to produce versions of their large frame revolvers chambered for the standard .45 ACP cartridge. These weapons will be discussed shortly.

As more and more Doughboys were deployed to France, the demand for M1911 pistols exceeded the government's original estimates. Colt and Remington-UMC were turning out the weapons as fast possible so other sources were sought. In the summer of 1918, the government contracted with the following firms for production of M1911 pistols:

Members of the U.S. Army's Company B, 316th Military Police, 91st Division catching up on their mail and reading. The MP in the center is cleaning his M1911 .45 pistol. (U.S. Army Military History Institute)



Right-side view of Colt M1911 .45 pistol manufactured in 1918. Note the lanyard ring on the bottom of the magazine and the diamond-shaped area around the grip screws.

North American Arms Company (Canada)
Winchester Repeating Arms Company
National Cash Register
Caron Brothers Manufacturing Co.
Burroughs Adding Machine Company
Lanston Monotype Company
Savage Munitions Company (A.J. Savage)
Savage Arms Corporation

Only a couple of these firms had previously manufactured firearms and none had ever made the M1911 pistol. It was projected that these firms would be able to turn out a total of 2,550,000 M1911 pistols by the time all of them got into full production. However, this was not to be. None of the companies was able to get into production before the Armistice, when all outstanding contracts were canceled. North American Arms Co. turned out a small pre-production quantity (estimated at around 100) of M1911 pistols before the contracts were canceled. The Savage Munitions Company produced some slides, but is not believed to have made any complete pistols. A few of the Savage slides were used as spare parts to assemble pistols with Colt (and possibly other) receivers, primarily for overhaul purposes. Other than a handful of tool room models, none of the other firms produced any M1911 pistols. Therefore, the only entities to manufacture the M1911 pistol in quantity during (or before) WWI were Colt, Remington-UMC and Springfield Armory.

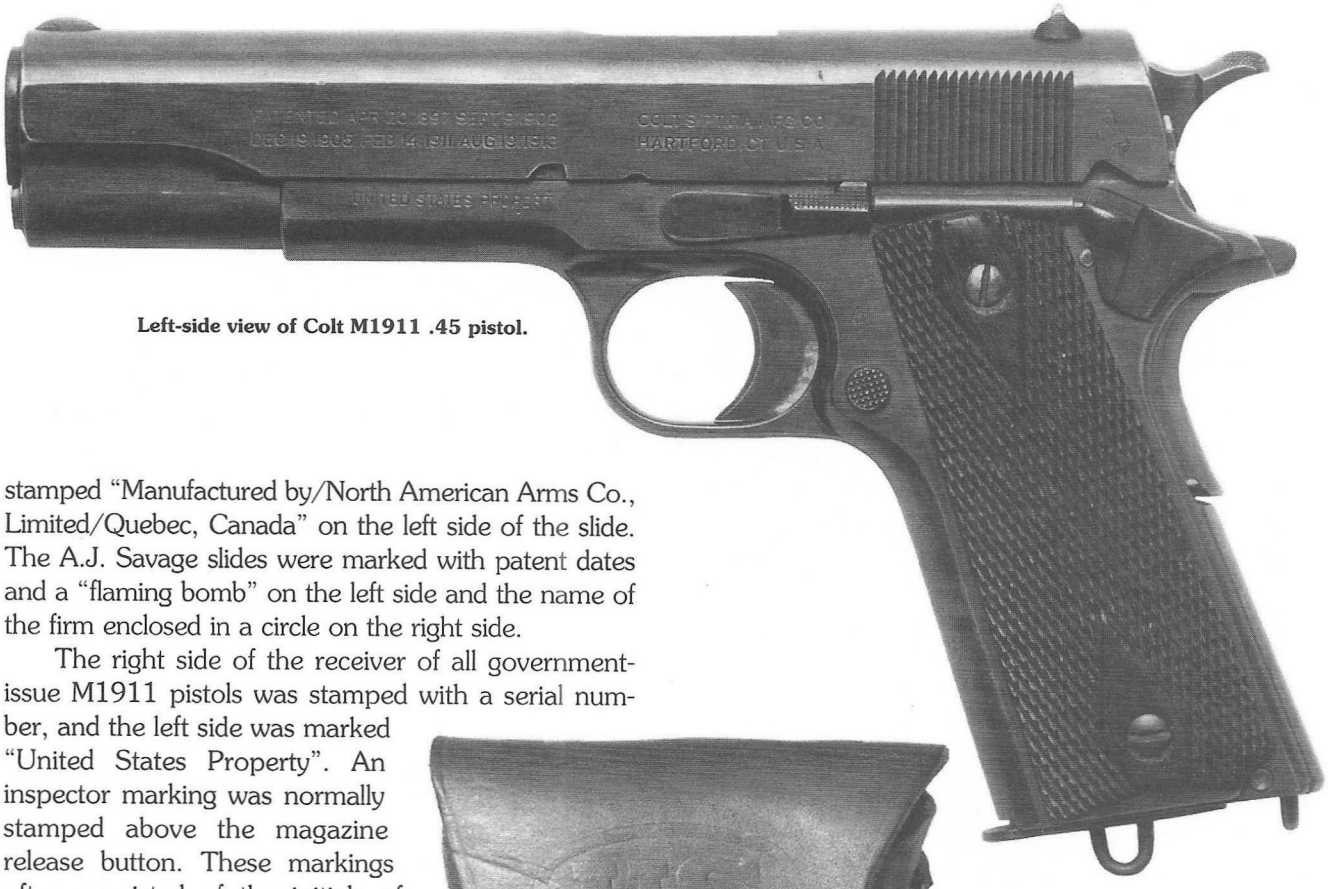
All M1911 pistols were finished in blue and had checkered walnut grips with a distinctive diamond-shaped pattern around the grip screw. The right side of the slide was marked "Model of 1911 U.S. Army". The relatively few made specifically under Navy or Marine Corps contracts were marked "U.S. Navy" or "U.S.M.C." in place of "U.S. Army". The left side of the slide was marked "COLTS PT.F.A.MFG.CO." along with patent dates.

The M1911 pistols made before the war by Springfield were marked "Springfield Armory/U.S.A." on the left side of the slide next to the patent dates and a "spread eagle" on the right side.

The Remington-UMC pistols were marked "Remington/UMC" enclosed in a circle logo on the left side of the slide next to "Manufactured by/Remington Arms UMC Co., Inc./Bridgeport, Conn., U.S.A." and various patent dates.

The few pistols made by North American Arms were

Close-up view of markings on left side of receiver and slide. Note the "United States Property" marking.



Left-side view of Colt M1911 .45 pistol.

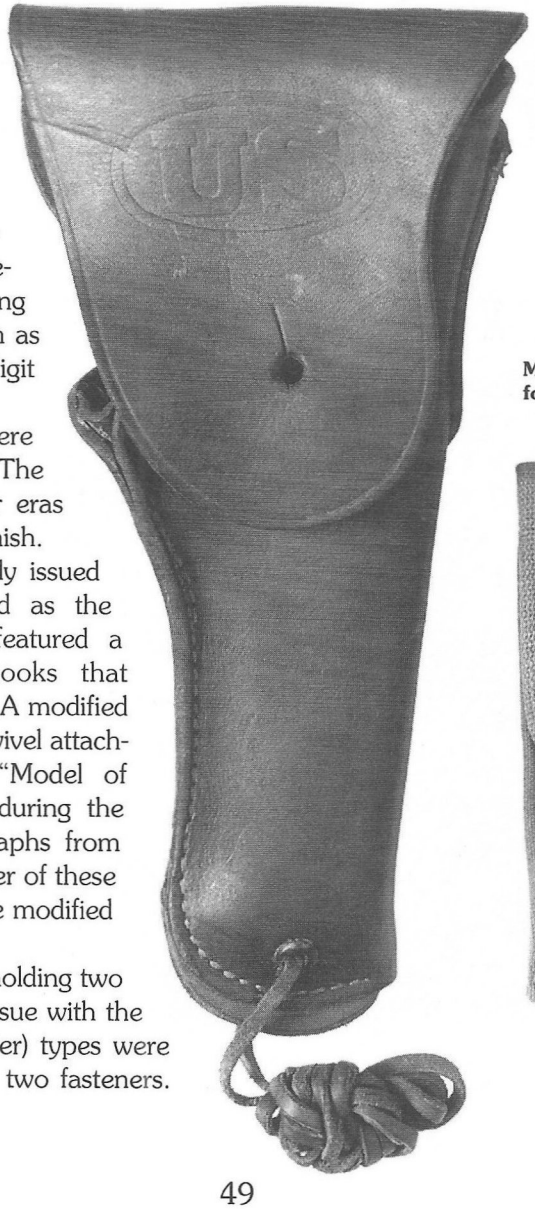
stamped "Manufactured by/North American Arms Co., Limited/Quebec, Canada" on the left side of the slide. The A.J. Savage slides were marked with patent dates and a "flaming bomb" on the left side and the name of the firm enclosed in a circle on the right side.

The right side of the receiver of all government-issue M1911 pistols was stamped with a serial number, and the left side was marked "United States Property". An inspector marking was normally stamped above the magazine release button. These markings often consisted of the initials of the inspector entwined in a circle. Many M1911 pistols of WWI-vintage will be found with an eagle-head-shaped inspector marking along with a letter and number code such as a "S" followed by a one- or two-digit number.

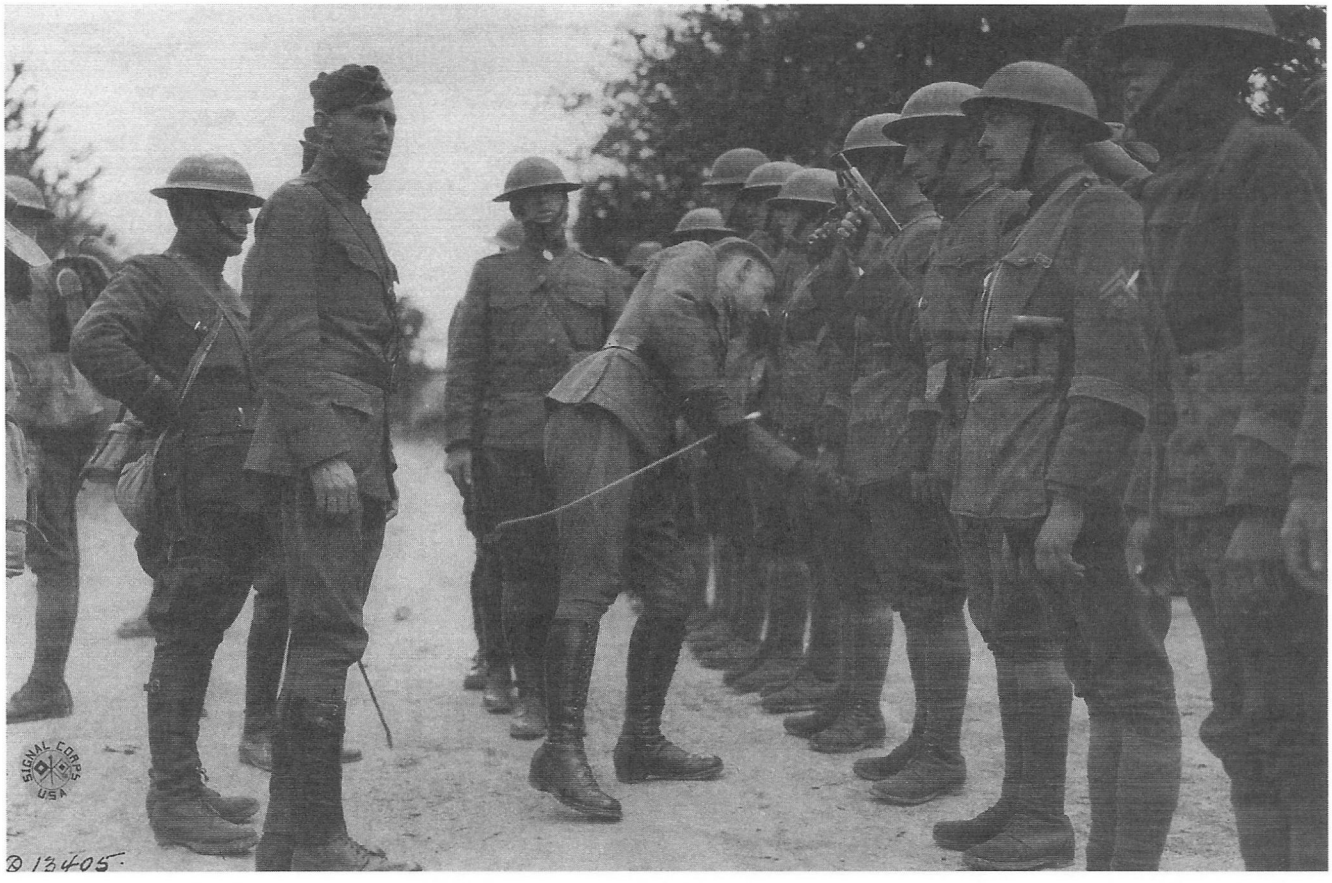
Prior to 1918, the magazines were normally fitted with a lanyard loop. The magazines of the WWI and earlier eras will have a distinctive "two-tone" finish.

The M1911 pistol was originally issued with a leather holster, designated as the "Model of 1912." This model featured a swivel attachment with wire hooks that attached to the standard pistol belt. A modified version of the holster without the swivel attachment was standardized as the "Model of 1916." Both types were utilized during the First World War. Vintage photographs from 1917 and 1918 reveal that a number of these holsters were cut-down or otherwise modified to suit their users.

A canvas-web magazine pouch holding two magazines was also produced for issue with the M1911 pistol. The WWI (and earlier) types were made with a cover flap secured by two fasteners.



M1916 holster and magazine pouch for M1911 .45 pistol.



Doughboys of the 1st Field Battalion, Signal Corps, Robert-Espagne, France. Note the M1911 .45s ready for inspection. Photo taken May 16, 1918. (National Archives)

American marksmen demonstrating their skills to the French during WWI. Note the M1911 pistol (and M1912 swivel holster) in the foreground and the M1903 Springfield rifles being fired in the background. (National Archives)

Early production versions had metal buttons with an embossed eagle head. In order to speed production during WWI, the metal buttons were replaced by the simpler "lift the dot" fasteners. The name of the maker and year of production was stamped inside the flap. The magazine pouch was secured to the pistol belt by means of a snap that mated into a corresponding snap on the left front of the pistol belt.

As the Doughboys were deployed to France, the M1911 .45 was an item of issue to commissioned and non-commissioned officers. Both combatant and non-combatant personnel were issued the weapons, although priority was given to combat troops. There were 643,755 M1911 pistols manufactured during the First World War period.

The M1911 proved to be a very popular weapon due to the rugged reliability of the design and the "man stopping" ability of the heavy .45 ACP slug. There were many instances recorded regarding the M1911's effectiveness as a combat weapon. The most famous Doughboy of them all, Alvin York, used the weapon to stop a German squad. Another less well-known, but equally heroic, member of the AEF, Sam Woodfill, utilized a M1911 .45 with telling effectiveness during his amazing feat of arms. As related in the book *The Doughboys*:

Like York, whose exploit Woodfill knew about, he placed his automatic where he could use it in a flash... Woodfill killed in succession five Germans (with his rifle)...when a sixth fellow reared with a bayonet, Woodfill pistoled him. The clearing was now quiet. Woodfill reloaded and strode forward to count his bag. He had shot six men in the head. Beyond him lay a German first lieutenant, seemingly dead. As Woodfill bent over to discover how five Springfield bullets and one Colt's slug could have killed a seventh man, this brave officer leaped up and seized Woodfill's rifle, at the same time reaching for his own Luger pistol. He got a bullet from the Colt in his heart...

Another passage from the book reveals the following regarding an officer in the famed "Lost Battalion" during intensive combat:

...Captain Holderman...stood erect using a pair of rifles as crutches, giving the gunner covering fire with his Colt .45...

These two examples are only a small fraction of the many instances that proved the M1911's worth as a combat weapon. The .45's undeniable effectiveness was often embellished with a bit of hyperbole. As an example, a passage in the book *The Doughboys* stated:

...First sergeants were armed with the Army's brutal Colt .45 automatic, which left an exit hole in a man's back the size of a derby hat.

Like many handguns, the M1911 .45 automatic was difficult to shoot well at any but point-blank ranges. However, such ranges were the norm for trench fighting. The M1911 soon gained a reputation as a reliable weapon, even when opportunities for proper cleaning and maintenance were not always present. And though an exit wound the size of a "derby hat" was a bit of an overstatement, the heavy .45 ACP round was ideal for close-quarter combat, and the pistol was unquestionably an effective "man stopper."

The 1920 *Harper's Pictorial* article alluded to previously stated:

A large calibered automatic pistol fired at a gentleman jabbing at you with a hungry-looking bayonet in the endeavor to make you share your trench with him, is very likely to abate the nuisance... Owing to the absolute necessity of immediately eliminating the foe — delivering the crumpling blow of the bullet on one who may be threatening the possessor of the pistol with almost certain death —

Col. F.B. Terrell, "Reconnaissance Officer" of the 6th Division, searching houses in the Ardennes region of France, November 1918 armed with a M1911 .45 pistol. (U.S. Army Military History Institute)

the United States adopted the .45 caliber with a ponderous 230 grain bullet...there is no disputing the superior efficiency of the large-caliber pistol...

A slightly modified version of the M1911 was standardized in the 1920s as the "M1911A1." These changes were superficial and consisted of minor alterations to the trigger, main spring housing, receiver and sights. Large number of WWI and earlier vintage M1911 pistols were overhauled from the 1920s into the Second World War. The overhaul process normally consisted of refinishing the metal by parkerizing and replacing the checkered walnut diamond-pattern grips with plastic grips. Refurbished M1911 and new production M1911A1 pistols were issued concurrently during World War II. The .45 automatic remained the standard-issue U.S. military handgun until the mid-1980s. It remains in limited use by our military to this day. The .45 automatic is regarded by many as the best combat pistol ever conceived and manufactured. It is hard to argue with this assessment. Even today, the M1911 (and subsequent variants) is one of the most popular handguns around.

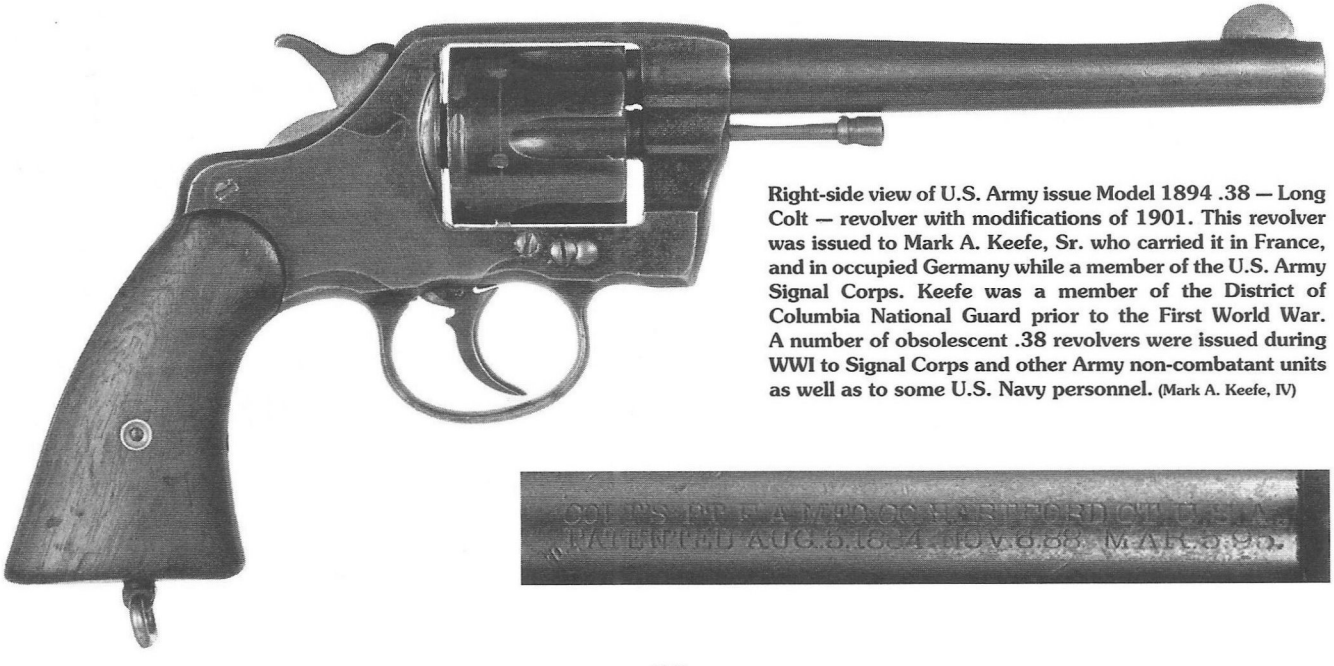
It is interesting to note that First World War vintage M1911 pistols remaining in their original "as issued" condition still turn up from time to time today. Large numbers of these weapons were tucked away in duffel bags and brought home by returning Doughboys, even though this was strictly against regulations. It has been estimated that as many as 50 percent of the pistols issued to the AEF were never turned in. While a number were undoubtedly legitimate combat losses, the majority were packed away in the "old kit bag" and quietly brought home as a souvenir of having been "Over There."

M1892-M1905 .38 LC Revolvers

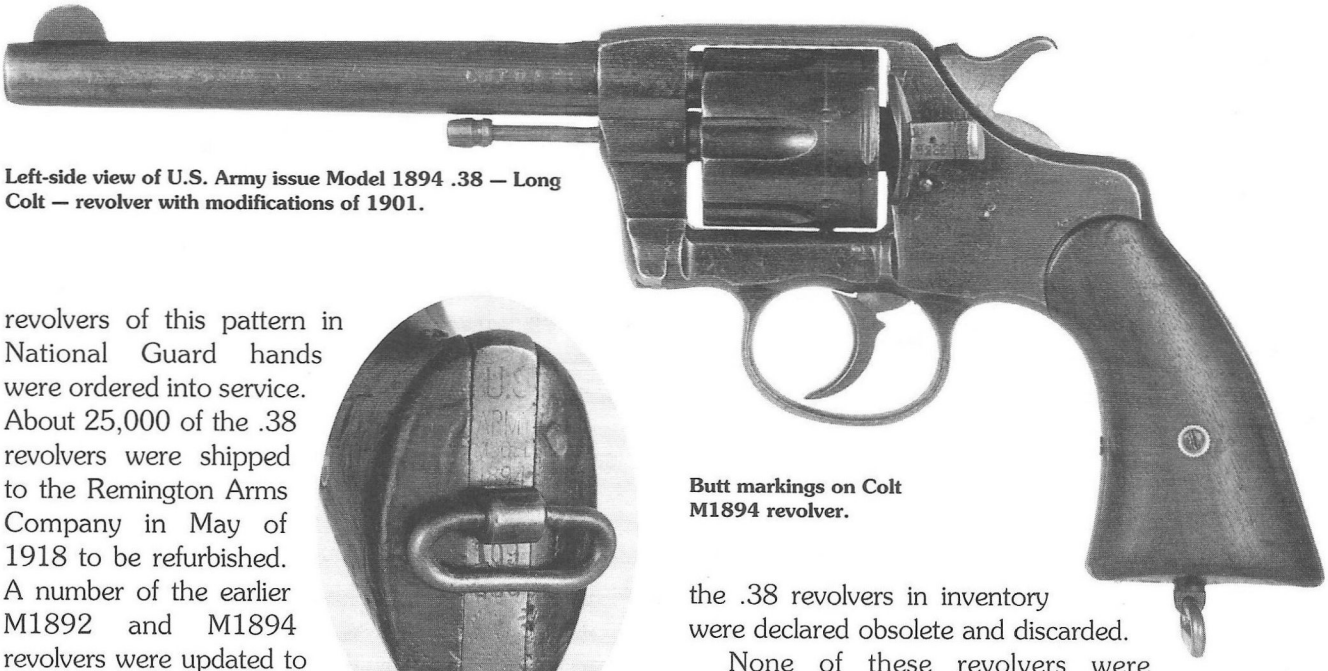
Despite the M1911 .45 automatic's unquestioned greatness, as we have discussed, the production rate during WWI was insufficient to meet the high demand. Although contracts were given to other firms for M1911 production, the lag time required for the additional sources to get "on line" was too great, and other handguns had to be procured.

At the beginning of the war, the shortage was so acute that about 25,000 of the old M1892-M1905 Colt .38 revolvers (chambered for the ineffective .38 Long Colt cartridge) were taken out of storage and issued as supplementary side arms to some non-combatant units, both stateside and overseas. The revolvers were issued with the same holsters used when they were the standard service side arm in the 1892–1910 period. This was a leather holster (embossed "US") with a partial cover flap and a wide belt loop on back. The holster was of the cavalry-influenced "butt forward" configuration.

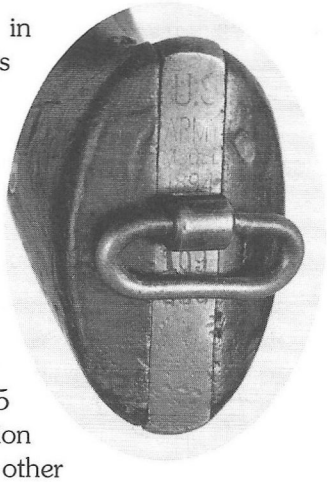
Most of these revolvers issued during the WWI period were updated M1892 and M1894 models or the later M1901, M1903 and M1905 variants. Putting these revolvers back into production was briefly considered but was soon rejected primarily due to the ineffectiveness of the cartridge. In 1917, General Pershing authorized the issue of these obsolete revolvers to Signal Corps, engineering and rear-echelon service troops. In January of 1918, all of the



Right-side view of U.S. Army issue Model 1894 .38 — Long Colt — revolver with modifications of 1901. This revolver was issued to Mark A. Keefe, Sr. who carried it in France, and in occupied Germany while a member of the U.S. Army Signal Corps. Keefe was a member of the District of Columbia National Guard prior to the First World War. A number of obsolescent .38 revolvers were issued during WWI to Signal Corps and other Army non-combatant units as well as to some U.S. Navy personnel. (Mark A. Keefe, IV)



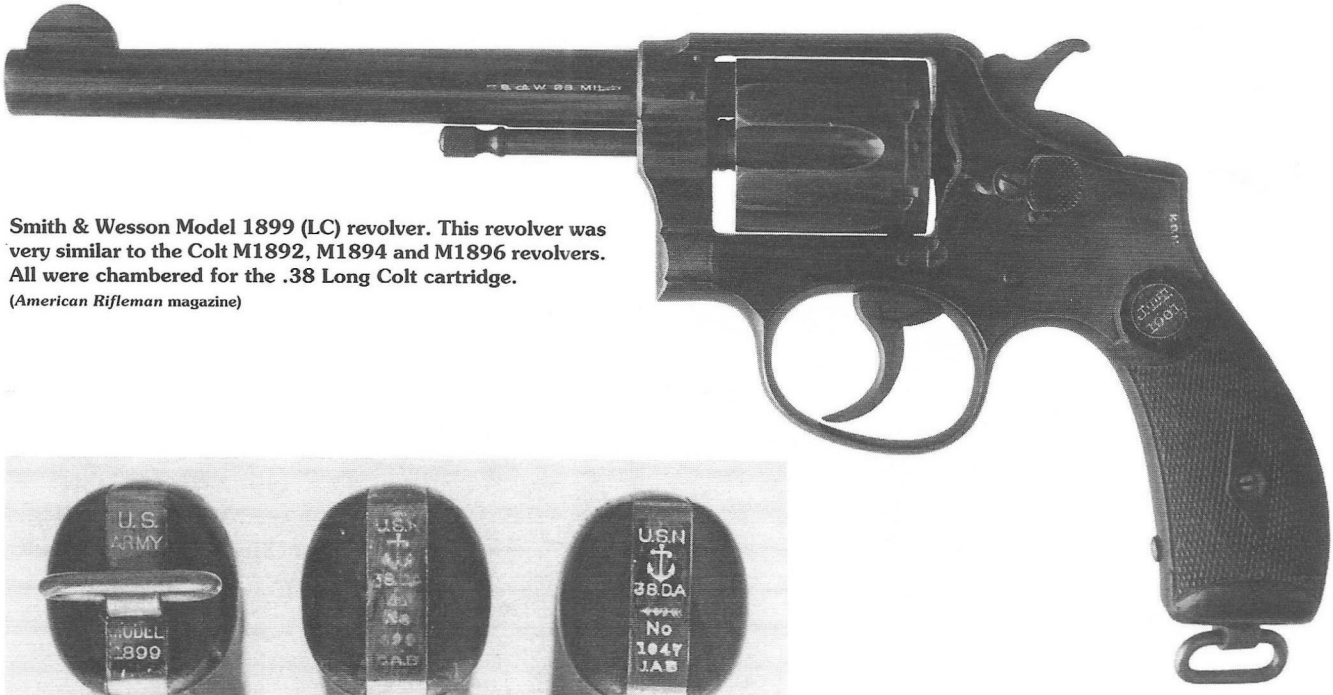
Left-side view of U.S. Army issue Model 1894 .38 — Long Colt — revolver with modifications of 1901.



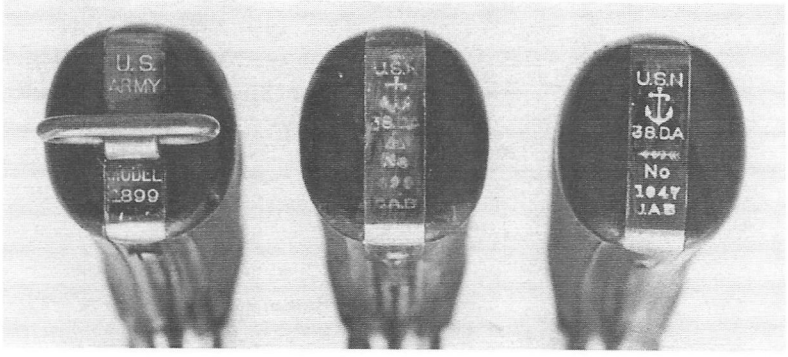
Butt markings on Colt M1894 revolver.

revolvers of this pattern in National Guard hands were ordered into service. About 25,000 of the .38 revolvers were shipped to the Remington Arms Company in May of 1918 to be refurbished. A number of the earlier M1892 and M1894 revolvers were updated to M1901/M1903/ M1905 specifications by the addition of a lanyard ring and other improvements. Approximately 7,000 of the .38 caliber revolvers were subsequently acquired by the U.S. Navy. After April of 1918, none of these arms were issued to troops embarking for France. Their issuance was restricted to use by the U.S. Navy and for supplemental use stateside. After the war, all of the .38 revolvers in inventory were declared obsolete and discarded.

None of these revolvers were intended for issue to combat troops. They were solely utilized by non-combatant rear echelon and service troops. Of course, it is likely that a few were carried into the front lines, but this would have very much been the exception and not the rule. Nevertheless, the use of the obsolete .38 caliber Colt revolvers allowed for much larger numbers of the infinitely more effective .45 caliber weapons to be available for front-line combat duty.



Smith & Wesson Model 1899 (LC) revolver. This revolver was very similar to the Colt M1892, M1894 and M1896 revolvers. All were chambered for the .38 Long Colt cartridge. (*American Rifleman* magazine)



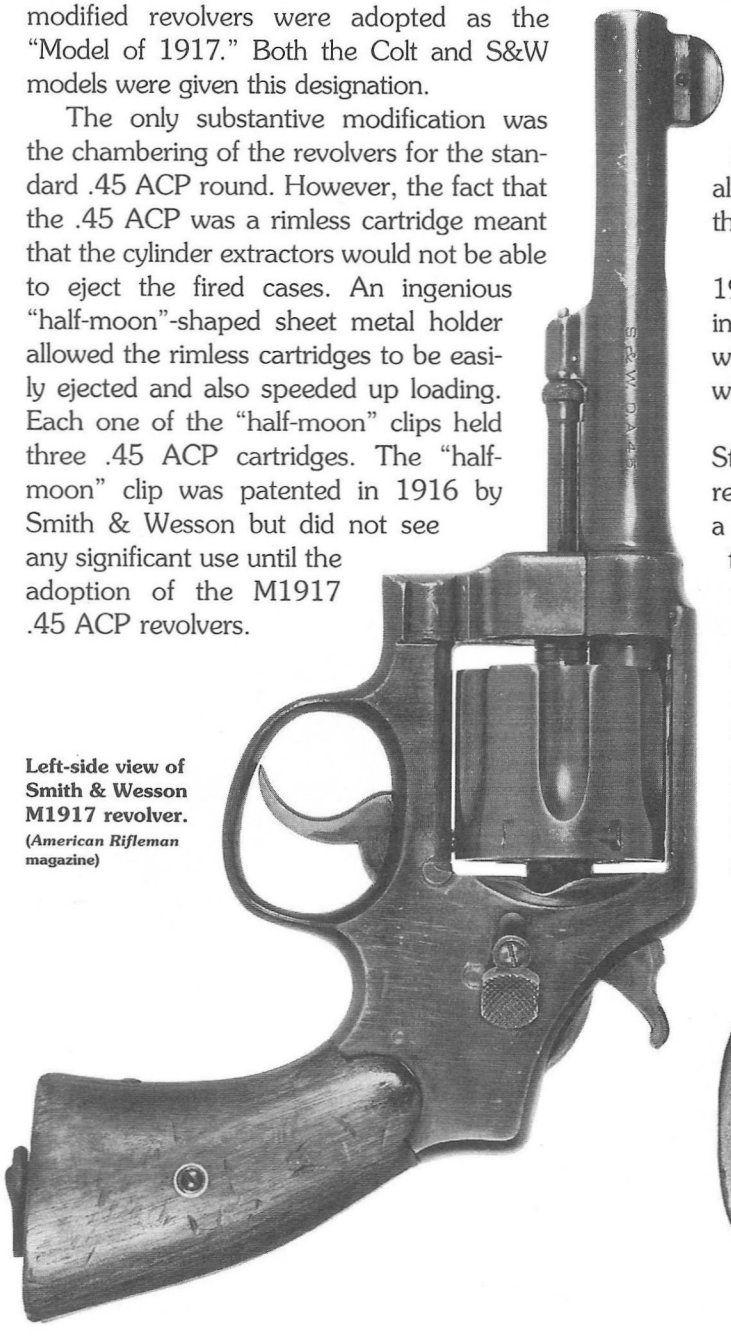
Butt markings on S&W .38 revolvers. The revolver at far left is a M1899 U.S. Army variant and the other two are U.S. Navy issue. (*American Rifleman* magazine)

.45 Caliber M1917 Smith & Wesson and Colt Revolvers

While the various .38 caliber revolvers helped meet the demand for side arms by non-combatant personnel, there was still a serious shortage of handguns suitable for combat duty. As we have discussed, the excellent M1911 .45 automatic was in short supply, and increased production fell far short of demand.

To this end, the Ordnance Department contracted with Smith & Wesson and Colt for the production of their large frame double-action revolvers. The modified revolvers were adopted as the "Model of 1917." Both the Colt and S&W models were given this designation.

The only substantive modification was the chambering of the revolvers for the standard .45 ACP round. However, the fact that the .45 ACP was a rimless cartridge meant that the cylinder extractors would not be able to eject the fired cases. An ingenious "half-moon"-shaped sheet metal holder allowed the rimless cartridges to be easily ejected and also speeded up loading. Each one of the "half-moon" clips held three .45 ACP cartridges. The "half-moon" clip was patented in 1916 by Smith & Wesson but did not see any significant use until the adoption of the M1917 .45 ACP revolvers.



Left-side view of Smith & Wesson M1917 revolver. (*American Rifleman* magazine)

M1917 Smith & Wesson Revolver

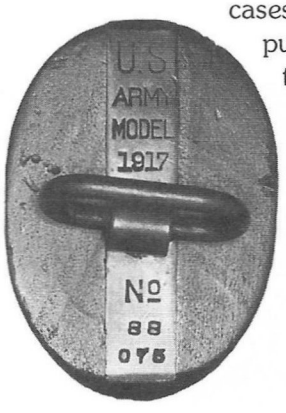
Smith & Wesson Company had previously supplied Great Britain with some 68,650 of its "New Century" heavy-frame revolvers chambered for the .455 Webley cartridge. Smith & Wesson had initially produced the revolver for the domestic American market chambered for a .44 caliber round. Some of the weapons procured by the British were modified .44 caliber revolvers.

In 1917, the U.S. Ordnance Department contracted with Smith & Wesson for production of a slightly modified version of the firm's New Century double-action revolver chambered for the .45 ACP round. The newly developed "half-moon" clip allowed this cartridge to be used with revolvers such as the S&W.

The modified revolver was adopted as the "Model of 1917" and was finished in a commercial grade of bluing with smooth walnut grips. The butt was stamped with the model designation and serial number and fitted with a lanyard ring.

The underside of the barrel was marked "United States Property". The Smith & Wesson M1917 revolver weighed 2¼ pounds and was 10¼" long with a 5½" barrel. The front sight was a rounded blade, and the rear sight consisted of a "V" notch milled into the top of the receiver.

Production began on the M1917 S&W revolver on October 27, 1917, and the firm eventually delivered 166,732 of the big revolvers to the government until the production contract was canceled on February 1, 1919. An interesting feature of the S&W M1917 was that the cylinder was chambered and head-spaced so that the rimless .45 ACP cartridge could be inserted and fired without the use of the "half-moon" clips. However, the fact that the fired cases had to be individually pushed out with a stick or other tool restricted such use to emergency situations when the clips were not available.



Butt markings on S&W M1917 revolver. (*Garand Stand* collection)

Right-side view of S&W M1917 revolver.
(*Garand Stand* collection)

"United States Property" markings on S&W M1917 barrel.
(*Garand Stand* collection)

U.S. Army officers of the 2nd Brigade, 1st Division, viewing German positions on September 12, 1918. Note the M1917 revolver carried in a non-standard leather holster by the officer in the center. The officer is identified as Captain P. Hendrick.
(National Archives)

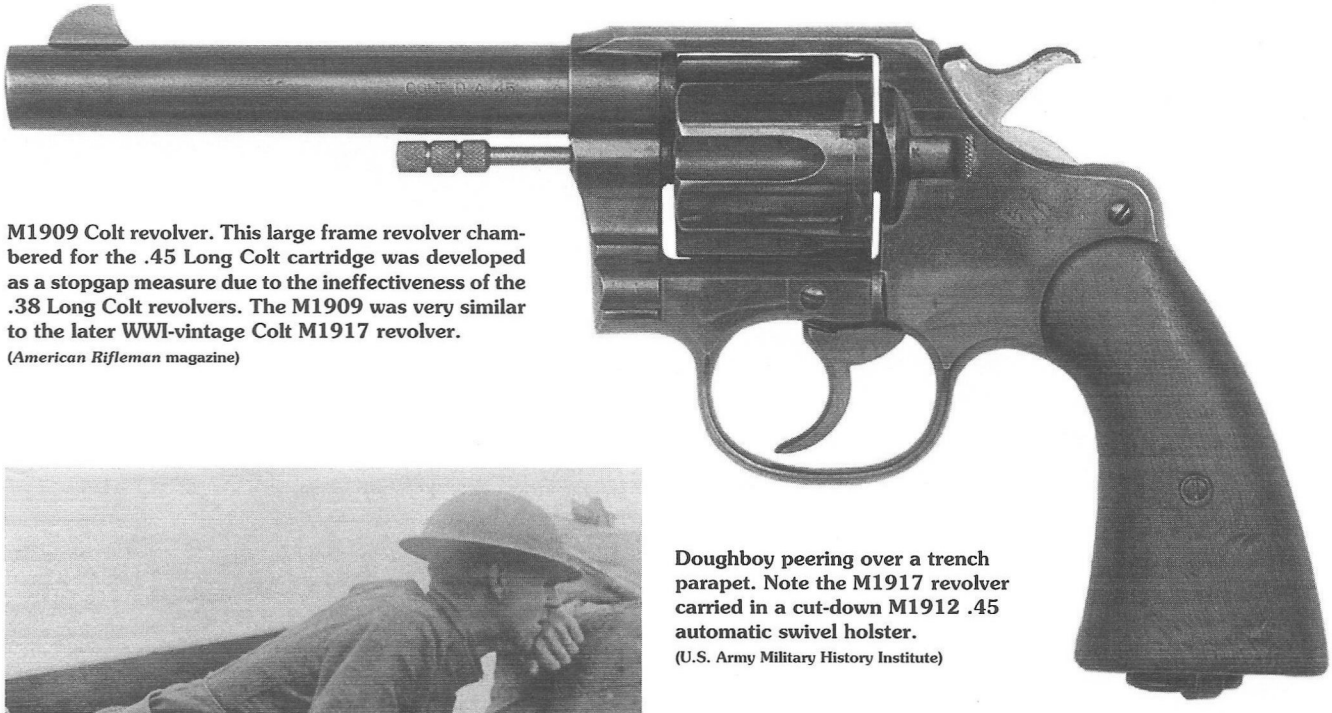
M1917 Colt Revolver

In order to augment the Smith & Wesson's production of the M1917 revolver, the government contracted with Colt to manufacture a slightly modified version of its heavy-frame "New Service" revolver chambered for the .45 ACP cartridge. This revolver was given the same "Model of 1917" designation as the Smith & Wesson gun, and was very similar to the Colt M1909 revolver previously manufactured for the U.S. military. Colt had produced a number of virtually identical New Service revolvers under British contract chambered for the .455 cartridge. Even though Colt was heavily burdened with production of the M1911 pistol, the M1917 revolver could be made on different machinery that was already in place. Therefore, production of this weapon did not seriously hinder that of the higher-priority M1911 pistol.

The Colt M1917 revolver was dimensionally very similar to the S&W M1917 revolver. It weighed 2½ pounds and was 10.8" in overall length with a 5½" barrel. The front sight was a fixed blade, and the rear sight was a square notch milled into the top of the receiver. Some of the front sights may appear to be bent. This was usually due to the practice of "zeroing" the revolvers by hitting the front sight with a mallet to achieve proper windage!

As was the case with the S&W M1917 revolver, the model designation and serial number were stamped on the butt and a lanyard ring was fitted. Most examples of the Colt M1917 will be found with a so-called "brushed" blue finish indicating that the

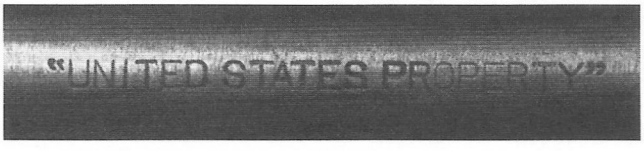
Text continued on page 58.



M1909 Colt revolver. This large frame revolver chambered for the .45 Long Colt cartridge was developed as a stopgap measure due to the ineffectiveness of the .38 Long Colt revolvers. The M1909 was very similar to the later WWI-vintage Colt M1917 revolver.
(*American Rifleman* magazine)

Doughboy peering over a trench parapet. Note the M1917 revolver carried in a cut-down M1912 .45 automatic swivel holster.
(U.S. Army Military History Institute)

"United States Property" markings on Colt M1917 barrel.
(*Garand Stand* collection)



Right-side view of Colt M1917 revolver. **(*Garand Stand* collection)**

Butt markings on Colt M1917 revolver.
(*Garand Stand* collection)

Left-side view of Colt M1917 revolver. (*American Rifleman* magazine)

U.S. Army antiaircraft crew, Battery C, 322nd Artillery, 83rd Division, manning a M1914 Hotchkiss machine gun. Photo dated September 28, 1918. All members of the crew are armed with M1917 revolvers. (U.S. Army Military History Institute)

Grouping of Colt M1909 revolver and accessories including pistol belt, holster and manual. (*American Rifleman* magazine)

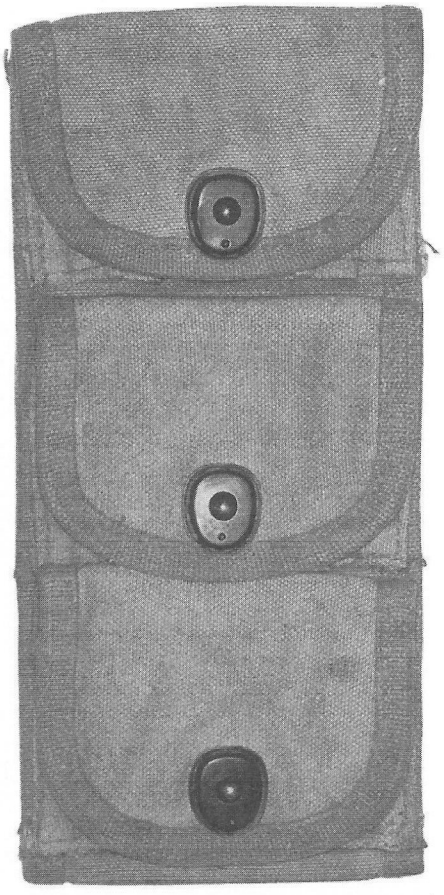
Text continued from page 55.

metal was not finely polished prior to bluing. While not as attractive as the commercial-grade blue found on the S&W M1917 revolver, it was entirely adequate for its intended purpose. The underside of the barrel was stamped "United States Property".

The first 50,000 Colt M1917 revolvers were fitted with straight chambers that did not allow the .45 ACP cartridge to headspace properly. Therefore, revolvers of this pattern could not be fired at all without using the "half-moon" clips. This feature was subsequently changed, and later versions had "stepped" chambers as found on the S&W M1917 revolvers that allowed them to be fired without the use of the clips. However, the fired cases had to be removed manually. Colt delivered a total of 151,700 M1917 revolvers to the government during WWI.

(left) WWI-production M1909 holster issued with M1917 revolvers. This holster was designed to carry the revolver in the "butt forward" position. (*Garand Stand* collection)

(below) Canvas pouch designed to hold three sets of .45 ACP "half-moon" clips. (*Garand Stand* collection)



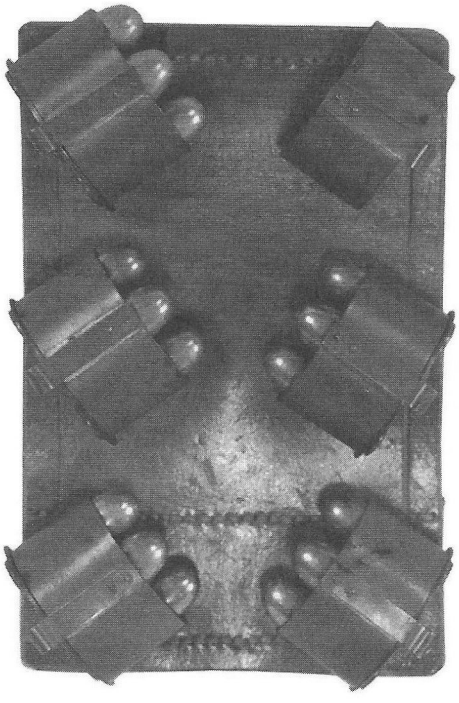
Both the Smith & Wesson and Colt M1917 revolvers were issued with a leather holster having a cover flap that partially covered the butt and a wide belt loop that enabled the weapon to be carried on the standard pistol belt. The holster was of the cavalry pattern and was carried on the right hip with the butt forward. The front of the holster was embossed with a large "US" and the back was marked with the name of the maker and the year of production. A tie-down loop was installed on the bottom of the holster. In order to carry extra ammunition, a canvas pouch holding three sets of half-moon clips was produced. Some WWI-vintage photos depict the M1917 revolvers carried in modified M1916 .45 automatic holsters or by other means.

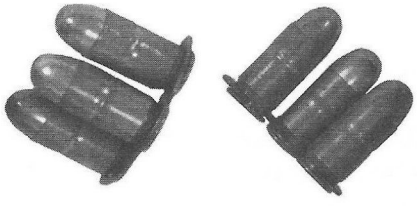
Initially, it was the U.S. Army's policy to restrict issue of the M1917 revolvers to non-combatant personnel and reserve the M1911 pistol for combat troops. However, the exigency of the war required that a number of the M1917 revolvers be issued for front-line combat duty. Most soldiers preferred the M1911 automatic, but a few Doughboys selected the M1917 revolver even when the M1911 automatic was available.

There has been little recorded regarding specific use of the M1917 revolvers, but anecdotal evidence indicates that the weapons provided adequate service within the limitations of a revolver for combat use. The potent .45 ACP cartridge added immeasurably to the M1917 revolver's utility.

Following the First World War, most of the M1917 revolvers were retired to the war reserve stockpile.

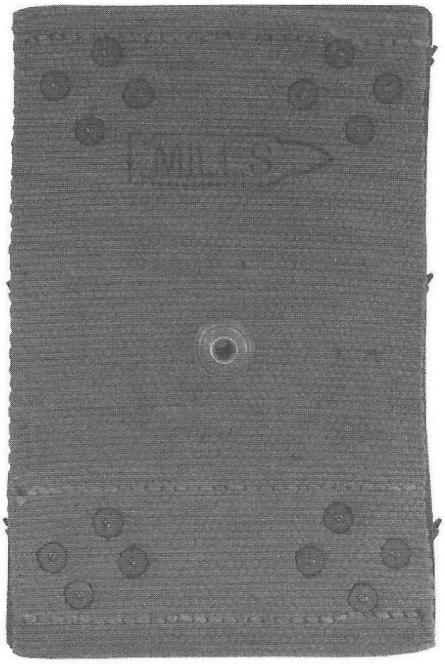
German Maxim machine gun captured by the 5th Division installed on an antiaircraft mount. Note the M1917 revolver and M1909 holster carried by the soldier, identified as Corporal Nicholas G. Powells, at the far left. Photo dated September 25, 1918. Note also British pattern bayonet scabbard at the far right. (National Archives)





(left) Rare experimental carrying pouch designed to hold three sets of "half-moon" clips. This pouch did not protect the clips from the elements as well as the canvas type, and it saw little, if any, field use. (Hayes Otoupalik collection)

(right) Rear view of experimental pouch. Note the "Mills Company" marking and the snap to hold the pouch to the standard pistol belt. (Hayes Otoupalik collection)



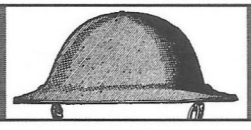
U.S. soldier (far left) with group of German prisoners during the First World War. Note the M1917 revolver in the M1909 holster in the "butt forward" position on the Doughboy's pistol belt. (National Archives)

Large numbers were later called back into service during World War II. Many were overhauled and refurbished by refinishing with parkerizing and replacing the walnut grips with plastic grips.

Whether armed with the superb M1911 or the serviceable M1917 revolver, the Doughboys carried a greater percentage of handguns than the troops of any other nation.

It has been estimated that some 60 percent of all combat troops were armed with handguns by the end of the war. The official TO&E requirement for pistols in 1918 for an infantry battalion was 322 and an infantry division was allotted 11,193 handguns. The majority of these were the M1911, but a significant number were the big S&W and Colt M1917 .45 revolvers. Without question, the handgun was a valuable part of the AEF's arsenal and the weapon's contribution to the ultimate victory shouldn't be overlooked.

Collector Notes



U.S. military handguns of all vintages have been perennially popular collectibles, and the pistols and revolvers used by the United States during WWI are no exception. Other than originality, the most important consideration regarding collectibililty is condition. Mint or unused specimens are not very common since the vast majority of these arms issued during the war will reveal the rigors of service use. Also, as stated, very large numbers of the WWI handguns were subsequently overhauled from the 1920s into WWII which drastically reduced the available supply of

original, unaltered specimens. It should be remembered that none of the handguns of any type issued during the First World War had parkerized finishes or plastic grips. If any are encountered with these features, the weapon has been modified from its original configuration, and will be substantially devalued as a collectible. Certainly, a handgun overhauled by a government arsenal is a legitimate U.S. martial weapon, but its value and general desirability will be less than that for an unmodified "as issued" specimen.

M1911 .45 Automatic

The M1911 and variants are among the most popular types of military handguns today and collector-grade specimens often exchange hands for surprisingly high prices. Generally speaking, the pre-WWI Colts and the pistols made by the other makers are among the most desirable. The most common variant encountered today will be the M1911 pistols made by Colt in the 1917–1918 period. However, in original configuration and excellent (or better) condition, even the more common variants are quite desirable and valuable collectibles.

Springfield Armory M1911 pistols have been popular for a number of years. This weapon is noteworthy, as it was the last handgun manufactured by the National Armory in Springfield and the only one produced at that venerable institution in the 20th century. Some Springfield-made M1911 pistols were sold through the auspices of the National Rifle Association to civilians. These weapons were marked "NRA". Despite being a somewhat uncommon variant, the NRA-marked pistols are a bit less desirable to most martial collectors than ones without this marking.

Another very popular collector variant is the Remington-UMC pistol. These were made in much smaller numbers than the Colts, and unaltered specimens are not very common on the market today. Given comparable condition, they are somewhat more valuable than the WWI-vintage Colts.

The North American Arms M1911 pistols are quite rare, and original specimens can be worth a great deal of money. Some spurious examples have been reported, so a potential buyer should be quite wary and consult someone knowledgeable on the subject before a substantial sum is paid for a supposedly original pistol of this type.

One interesting variant that is sometimes overlooked are the WWI-era M1911 pistols fitted with replacement A.J. Savage Co. slides. As stated, this firm is not known to have produced any complete pistols but did turn out a number of slides. It is presumed that these slides were used for replacement parts during overhaul. Most M1911 pistols fitted with such slides have Colt receivers, but a receiver made by another maker may occasionally be encountered. A pistol of this type should probably be valued somewhat higher than a typical arsenal overhauled M1911 but less than an original specimen.

There are several things that a collector or potential collector of these World War I vintage M1911 pistols should look for. Although markings will vary from one maker to the other, there were a number of features that all WWI (and earlier) vintage M1911 .45 automatics will have in common:

(1) Blued finish on external metal parts. Any parkerized pistols have been overhauled (or at least refinished) and do not remain in their original configuration. Many were commercially re-blued. These can usually be spotted easily as the bluing is the glossy "hot blue" rather than the deeper and richer rust blue used by Colt and the other manufacturers. Also, re-bluing will normally result in markings that are "washed out" or otherwise less distinct than found on factory original guns.

(2) Checkered walnut grips with diamond-shaped panels around the grip screws. Any other type of grip, such as plastic, is a sure sign the weapon does not remain in its original configuration.

(3) Inspector markings. The M1911 pistols were stamped with an inspector marking when they passed final inspection. The marking was normally applied on the left side of the receiver above the magazine release button.

(4) Serial number without a "C" prefix. Colt produced many M1911 pistols for the commercial market. They can easily be distinguished from the military contract guns by the lack of inspector and martial markings and the addition of a "C" prefix to the serial number. Any M1911 pistol with this prefix as part of the serial number is not a military issue weapon.

(5) "Two-tone" magazine with attached lanyard ring. This was the type of magazine originally issued with the M1911 pistols through WWI. Some replacement two-tone types without lanyard rings may be found but are less desirable than the original pattern. Blued or parkerized magazines are of post-WWI-vintage and not proper for display with a 1917–1918 (or earlier) vintage pistol.

In addition to the features outlined above, one must be certain that the serial number is proper for the manufacturer of the weapon. Each maker was assigned a block of serial numbers for their use. Table #18, on page 271, lists these blocks. This table will reveal the year of production and the maker to which a serial number was assigned. This is a very valuable tool for collectors.

A military issue M1911 pistol in nice, unaltered condition from the WWI (or earlier) period is an extremely collectible weapon, and values are sure to remain steady. Unfortunately, it must be mentioned that fakes, particularly among the early models and rare variants, are getting to be an increasingly serious problem. One should consult someone knowledgeable in the field and/or cultivate a relationship with a *reputable* dealer who will stand behind his merchandise. As these weapons continue to climb in price, the problem with fakes will only become greater. One would be well advised to invest in an authoritative book on the subject of M1911 pistols, such as Charles Clawson's *Colt .45 Services Pistols, Models of 1911 and 1911A1* or W.H.D. Goddard's *The Government Models: Development of the Colt Model of 1911.*

The various accouterments such as holsters are also very good items to collect, and presentable examples should be obtained whenever possible. The M1911 is a classic weapon of the First World War and, even today, a handy weapon to have around for personal protection.

M1917 Smith & Wesson and Colt Revolvers

While these big revolvers have never achieved the fame or popularity of the M1911 .45 automatic, they are, nevertheless, quite collectible in their own right. Until the past few years, very nice specimens could be found for extremely reasonable prices. Like most U.S. martial arms, however, these revolvers have started to increase in value rather dramatically, and prices have doubled or tripled in the past few years.

Prices for the Smith & Wesson and Colt variants are about the same, given comparable condition. Evaluating these weapons from a collector's perspective is pretty straightforward. Unless a gun has been modified, condition is certainly the determining factor regarding price and desirability. Excellent or better examples can still be found, although the lesser-conditioned pieces are much more common. In mint or factory new condition, these are spectacular guns. The beautiful commercial-grade rust blue and case-hardened hammers and triggers on many

specimens makes for a very attractive weapon. As mentioned, Smith & Wesson M1917 revolvers normally exhibit a better finish than the Colt variety which usually have a "brushed" blue finish. M1917 revolvers that have been refinished by subsequent civilian owners are quite common, and the same caveats as mentioned regarding refinished M1911 pistols apply.

The M1917 revolvers overhauled for service during WWII are quite easy to spot. These weapons were generally (but not always) parkerized and fitted with plastic grips in place of the original smooth walnut grips. The initials of the ordnance facility that performed the overhaul were usually stamped on the frame. These overhauled M1917 revolvers have started to gain in value among WWII collectors since the weapons saw a fair amount of use in the 1942–1945 period. However, a rebuilt revolver of this type would not be correct for a First World War collection.

A M1917 revolver that is missing the lanyard ring may be encountered from time to time. The absence of this feature reduces the collector value and desirability to some extent. Replacement lanyard rings could be found at one time but can be hard to come by now.

The WWI-vintage holsters are also getting to be rather hard to find. The identity of the maker and year of production were stamped on the back. Some holsters today are missing the bottom "plug" that contained the tie-down loop. Such examples have diminished value. All of the WWI-vintage holsters were of the cavalry type (butt forward position) but some of the conventional type (butt to the rear) were made during the Second World War. A collector wishing to obtain a WWI-vintage example should be sure that it is of the correct pattern. Some reproduction M1917 holsters have been made in the past few years, so buyers of examples that appear new should be wary. The canvas "half-moon" pouches are not extremely common but can still be found at fairly reasonable prices today. The same is true for the khaki WWI-vintage web pistol belts. These belts are proper for the M1912/1916 and M1917 holsters.

M1892-M1905 Colt Revolvers

The series of double-action .38 LC military revolvers made by Colt have only been marginally popular with collectors. Despite their unsatisfactory performance as combat arms, they are historic military weapons and fine collectibles. The many different variants make the weapon a great collector theme in its own right. Many of the older (M1892 and M1894) models were upgraded with the later features (lanyard ring, etc.). However, the revolvers were withdrawn from service and sold as surplus at the end of WWI and thus were not subjected to the widespread overhaul programs instituted after the war for other types of weapons. Decent examples are slowly rising in value and may very well become a "hot" collectible in the near future.

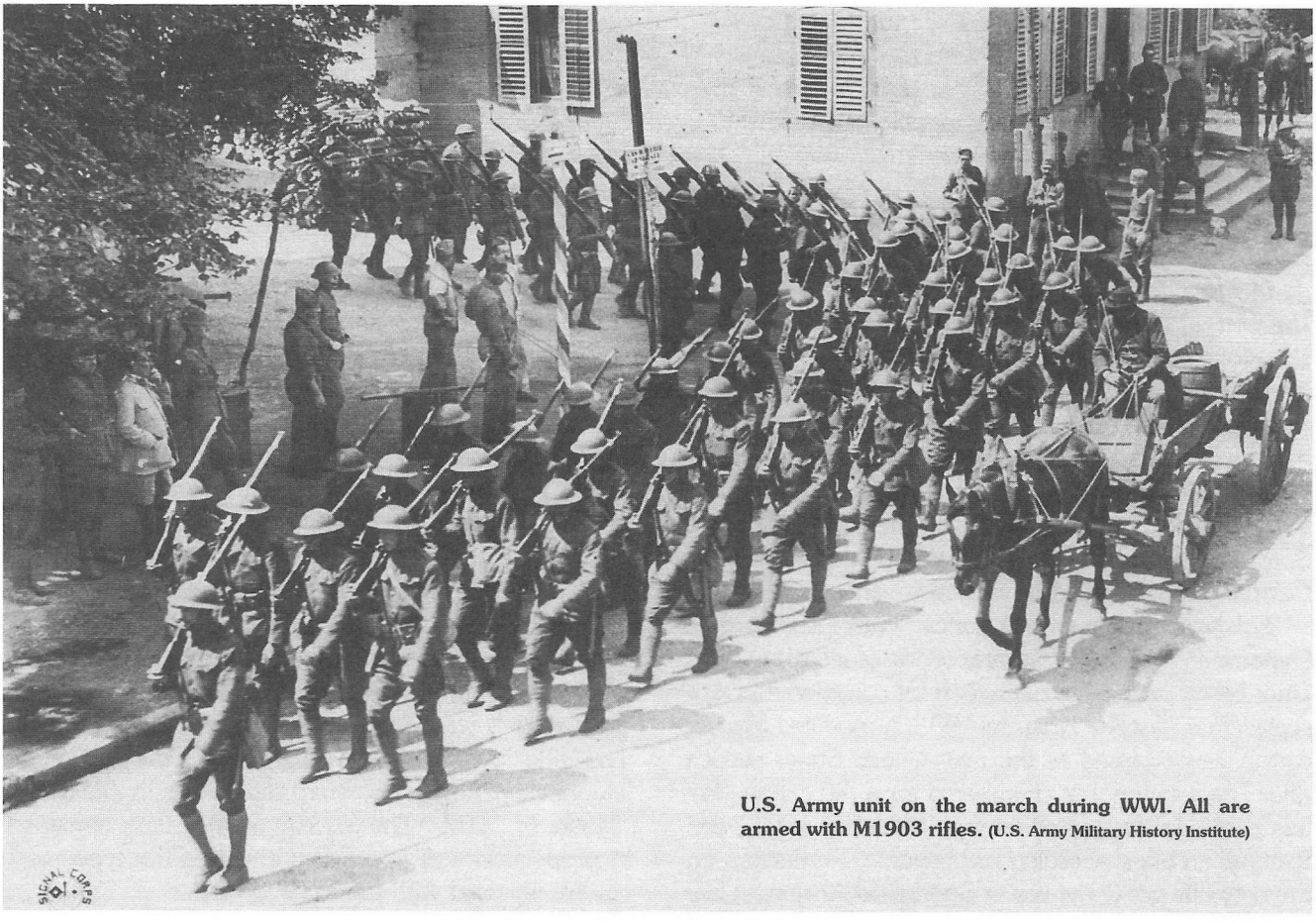
Many people are not aware of the role these obsolete .38 caliber revolvers played in the First World War as supplementary side arms. Like their contemporary, the Krag rifle, these Colt .38 revolvers were called out of retirement and issued until the modern standardized weapons could be produced in sufficient quantities. While they didn't see any combat in the trenches of France, the .38 revolvers did provide valuable, if unheralded, service to our troops during the First World War.

All of the United States military handguns of World War I are extremely collectible items and are certain to remain excellent investments.

Rifles

The weapon most intimately associated with the WWI infantryman was his rifle. From the first day of basic training until he was required to turn in his equipment prior to discharge from service, the rifle was the infantryman's constant companion. In training and non-combatant situations, the rifle was often viewed as a burden to bear on forced marches or a magnet for dirt and grime when viewed during inspection by the all-seeing eyes of the first sergeant. In combat, however, the rifle was truly a matter of life and death to the infantryman. As the Asst. Secretary of War stated regarding the use of rifles by the AEF during WWI:

Although in the 19 months of American belligerency in the Great War we had sent of France upward of two million soldiers, each rifleman among them as he stepped aboard his transport carried his own gun. This weapon, which was to be his comrade and best friend in the perilous months to come, was an American rifle, a rifle at least the equal of any in use by soldiers of other nations,



U.S. Army unit on the march during WWI. All are armed with M1903 rifles. (U.S. Army Military History Institute)

a rifle manufactured in an American plant.

While some European nations viewed the rifle as little more than a handle for a bayonet, Americans have always taken great pride in being a "nation of riflemen." Even as far back as the Revolution, the American fighting man's prowess with the rifle was legendary. This same sense of pride in the craft of rifle shooting was ingrained in subsequent generations of American fighting men. The Doughboy had often been a farm boy before being drafted into service and had literally grown up with a rifle in his hand. While the modern military service rifle of the day was a far cry from the typical .22 caliber rimfire of his youth, many Doughboys had already mastered the techniques of effective rifle shooting prior to donning Uncle Sam's uniform. Basic infantry rifle marksmanship training further honed their skills or else introduced the concept of rifle shooting to those new recruits and draftees who had little or no prior experience.

There were many instances recorded during the war regarding our Allies' (especially the French) amazement at the shooting ability of the average infantryman of the AEF. A 1919 article in *The Literary Digest* stated the following:

Under the fiercest fire, (the U.S. Marines) calmly adjusted their sights, aimed at a particular man, and got him. While the soldiers of our Allies used their small arms only when the foe was within two hundred yards, the Marines began bagging Germans at 1,000!

This is not to imply that every Doughboy was a highly trained marksman. Compared to virtually any other nation on earth, there was a greater percentage of competent riflemen in the American military.

Service Rifles

M1903 Springfield Rifle

The standard United States service rifle at the time of America's declaration of war was the "U.S. Magazine Rifle, Caliber .30, Model of 1903." Subsequently known to several generations of Americans as the "Springfield '03," "Springfield" or, simply, the "'03," the weapon is one of the best-known and most highly respected military service rifles of all time. This is aptly summed up in the following passage from the War Department publication *America's Munitions 1917–1918* that stated:

America, since the days of Daniel Boone a nation of crack shots, was naturally the home of good rifles. Hence, perhaps, it is not surprising that the United States should be the nation to produce the closest shooting military rifle known in its day. This was the United States rifle, model of 1903, popularly called the "Springfield."

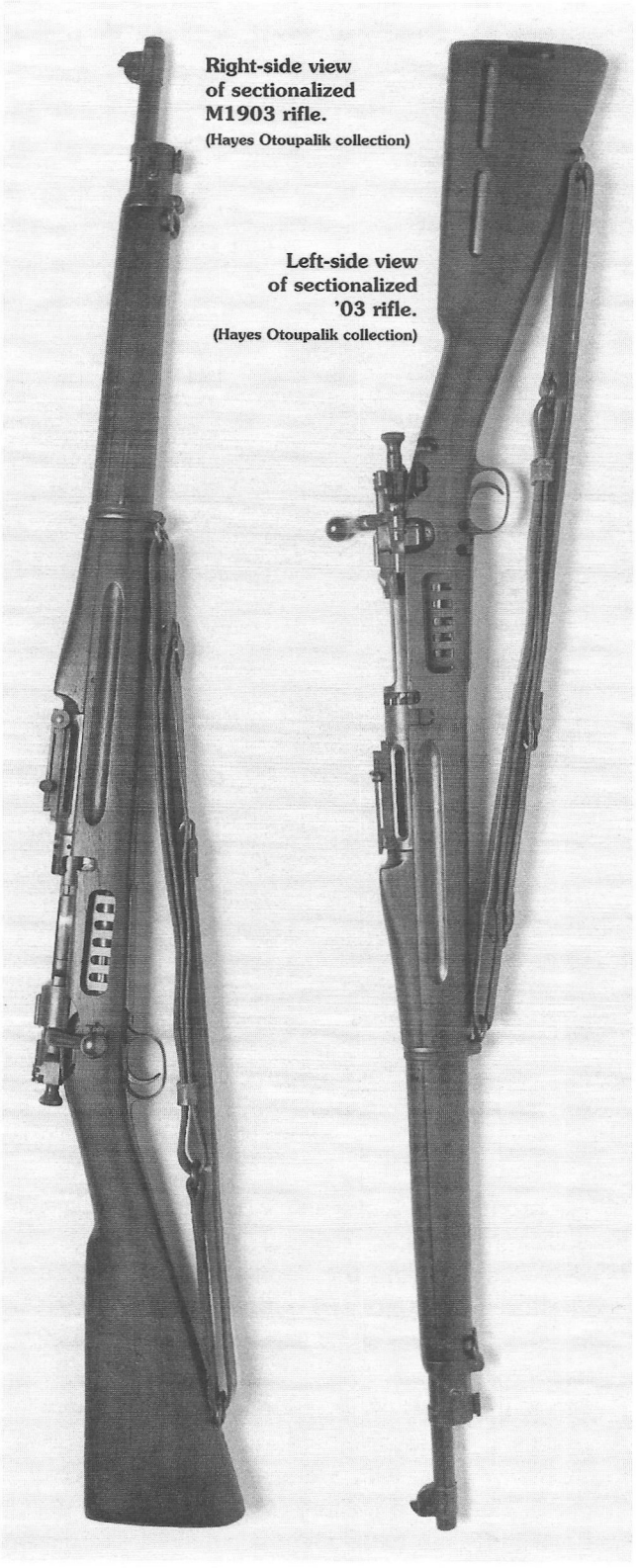
The '03 was adopted as a replacement for the .30-40 Krag-Jorgensen bolt action magazine rifle. The Krag revealed several serious deficiencies during the Spanish-American War as compared to the excellent German Mausers used by our adversaries.

Following the Spanish-American War, the Ordnance Department fabricated several types of rifles and carbines based on the Mauser action for consideration as a replacement for the Krag. In 1903, a modified Mauser design was adopted as the new United States service rifle. The weapon was chambered for a .30 caliber rimless cartridge designated as the "Model of 1903" and featured an unusual sliding rod bayonet. Production on the new rifle got underway at Springfield Armory in late 1903, and plans were formulated to have the weapon produced at Rock Island Arsenal as well.

As we have discussed, in 1905, the design of the rifle was changed to eliminate the unsuitable rod bayonet to be replaced by the M1905 knife bayonet. A change in the type of rear sight and handguard was also made concurrent with the elimination of the rod bayonet mechanism. The following year, a new cartridge was adopted to replace the original "M1903" round. The new cartridge was designated as the "Model of 1906" and was soon widely referred to as the ".30-06." (.**30** caliber, adopted in 19**06**). The new round had a muzzle velocity of about 2,800 fps.

With the alterations of 1905 (elimination of the rod bayonet and change in sights) and the incorporation of the excellent .30-06 cartridge, the M1903 rifle was in the same configuration that saw production for over thirty years and was in widespread military use for almost forty years. The M1903 rifle weighed 8.69 pounds with an overall length of 43½" and a 24" barrel. Most external metal parts were rust blued. The stock and handguard were made of quality black walnut. The metal buttplate had a hinged door that allowed access to a recess in the stock that held an oiler and thong case and other cleaning implements. Sling swivels were fitted to the lower band and stock. The rifle was originally issued with the "M1903" leather sling, but an improved sling was adopted as the "Model of 1907." The M1907 leather sling remained in production well into WWII and was the type most commonly used with the M1903 rifle.

Rock Island Arsenal also began production of the M1903 rifle beginning in very late 1903. However, output of complete rifles at the Illinois arsenal was quite limited until 1908. Other than receiver and barrel markings, the '03 rifles produced at Springfield and Rock Island were essentially identical. The receiver ring was stamped with "U.S.", the name of the manufacturer (Springfield Armory or Rock Island Arsenal), the model designation ("Model 1903") and the serial number. The top of the barrel (just behind the front

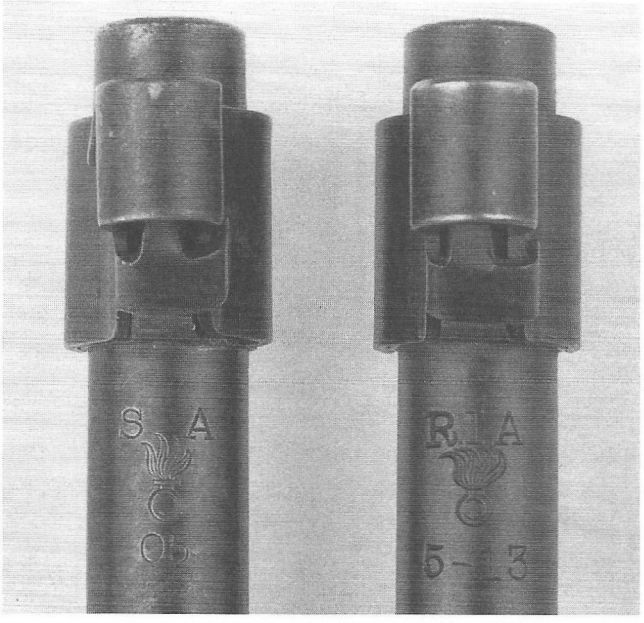


Right-side view of sectionalized M1903 rifle.
(Hayes Otoupalik collection)

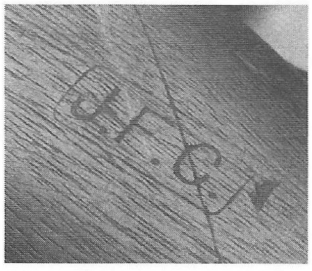
Left-side view of sectionalized '03 rifle.
(Hayes Otoupalik collection)

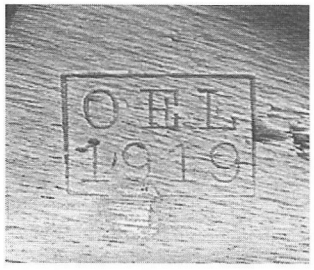
(above, left) Typical receiver marking on M1903 Springfield rifle. This example was made in 1912. Pre-1917 production '03 rifles saw a great deal of service in WWI.

(above, right) Typical receiver marking on early production M1903 rifle manufactured by Rock Island Arsenal.



Barrel markings on M1903 rifles. Example at left is very early (1905) production by Springfield Armory. Later variants were also marked with the month the barrel was produced. The example at right was made by Rock Island Arsenal in May of 1913. Note the removable stamped sheet metal sight covers on both examples.





(above, left) Stock cartouche on Springfield M1903 rifle. "J.F.C." is Springfield Armory inspector J.F. Coyle.

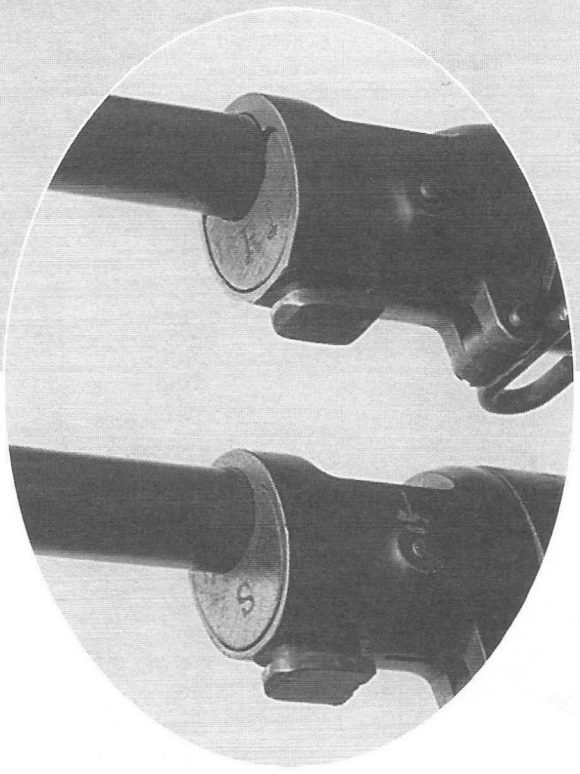
(above, right) Typical stock cartouche on Rock Island '03 rifle. This rifle was inspected in 1919 at Rock Island by Ora E. Lindsay.

M1903 rifle with leather cavalry scabbard.

sight) was stamped with the initials of the maker ("S.A." or "R.I.A."), an ordnance "flaming bomb" insignia and the month and year that the barrel was produced. The left side of the stock below the magazine cut-off recess was stamped with an inspector's cartouche. Prior to 1905, the Springfield Armory cartouches contained the year of production. After this date, the cartouche usually consisted of the inspector's initials (in block letters) enclosed in a rectangle. Rock Island cartouches normally consisted of the inspector's initials (in script letters) enclosed in a square. Unlike most Springfield Armory cartouches, all Rock Island cartouches were marked with the year of production. The letter "P" enclosed in a circle was stamped on the bottom of the grip behind the triggerguard on SA and RIA '03 rifles. This marking signified that the rifle had successfully been proof fired as part of the final inspection process. Variances will be found in the configuration of this marking.

It should be noted that the M1903 rifle was generally referred to as the "Springfield" regardless of whether a specific example was made at the National Armory in Massachusetts or at Rock Island Arsenal in Illinois.

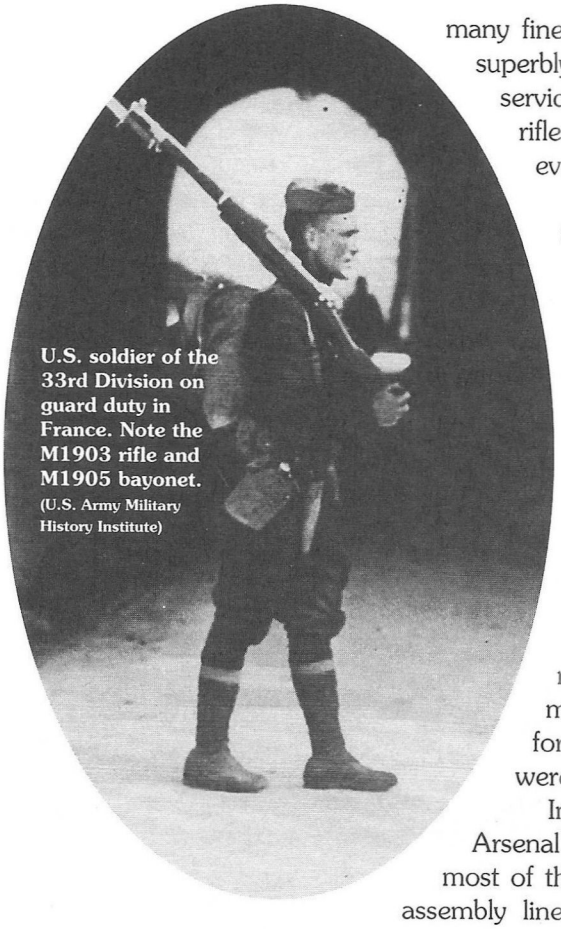
The M1903 rifle's rear sight was a folding leaf adjustable for elevation and windage. A removable stamped metal cover was produced to protect the front sight's blade from damage.



Markings on tips of M1903 stocks believed to be manufacturers' markings. The "RI" would indicate production by Rock Island Arsenal and the "S" would signify production by Springfield Armory. Not all stocks were marked in this manner.

As production continued, a number of relatively insignificant cosmetic changes were made in the M1903 rifle including the configuration of the stock and handguard, trigger and buttplate. Around 1910 a "bolt" or reinforcing screw was added to the stock to strengthen it.

From the time of its adoption until the eve of America's active involvement in the First World War, the '03 was made with a craftsmanship unsurpassed before or since for a military rifle. The fine rust bluing and quality walnut wood were equal to that found on



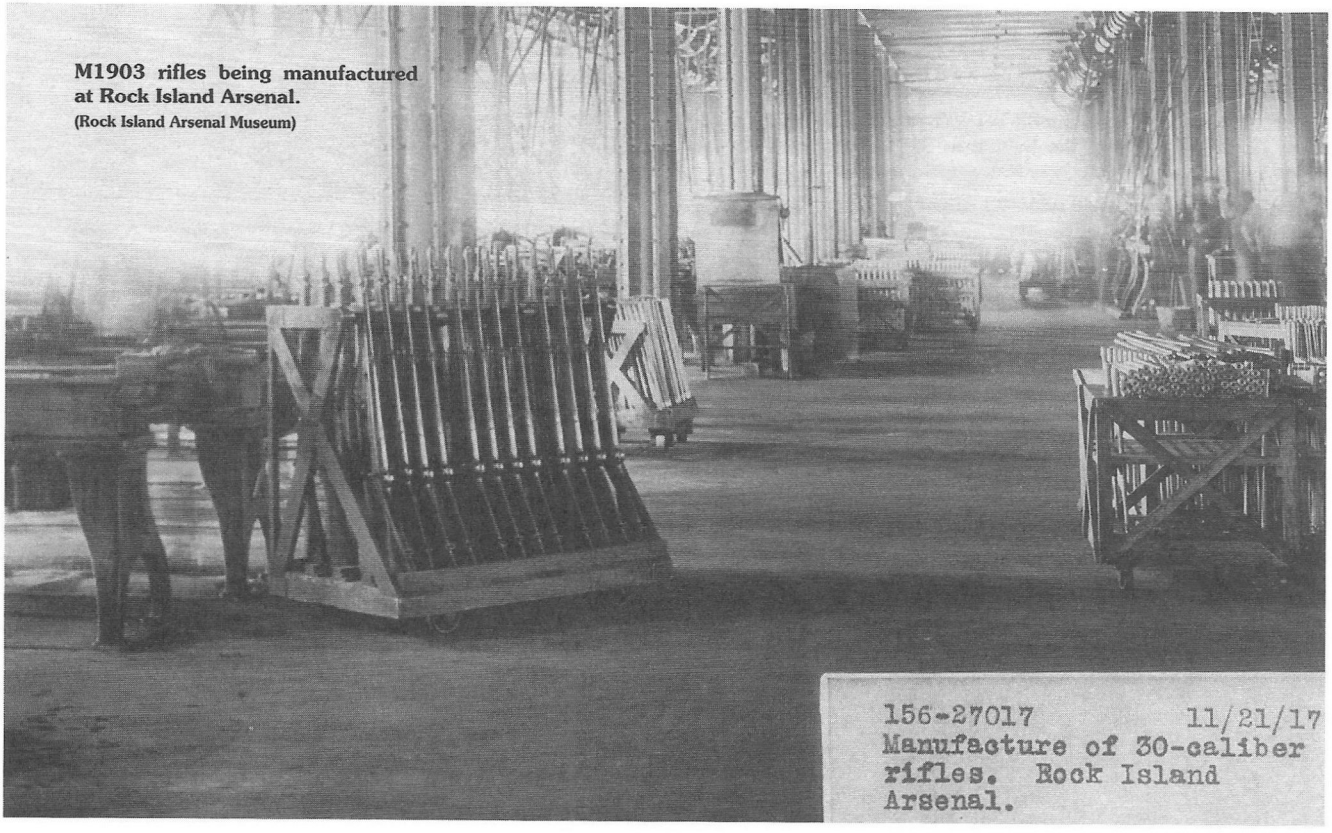
U.S. soldier of the 33rd Division on guard duty in France. Note the M1903 rifle and M1905 bayonet.
(U.S. Army Military History Institute)

many fine sporting rifles. The quality lavished upon the '03 resulted in a superbly crafted and supremely accurate rifle. Prior to the First World War, service-grade M1903s successfully competed against the finest target rifles of other countries in Olympic and other prestigious shooting events. As stated by the Assistant Secretary of War in 1919:

There was no questioning the superiority of the Springfield in point of accuracy. Time after time we pitted our Army shooting teams against those of the other nations of the earth and won the international competitions with the Springfield... Much is to be said for the men behind these guns, but due credit must be given the rifles that put the bullets where the marksmen aimed...

In late 1913, the government reduced appropriations for many types of military expenditures. This resulted in production of the '03 rifle being suspended at Rock Island Arsenal. Springfield Armory continued to manufacture the weapon after 1913 but at a reduced rate. The small prewar U.S. Army, Navy and Marine Corps was fairly well equipped with '03 rifles by this time. On the brink of the declaration of war, the United States military was armed with what was arguably the finest bolt action military rifle of all time. As America rushed to mobilize our armed forces, the biggest problem regarding the M1903 rifle was that there weren't nearly enough of them to meet the demand.

In order to address the dramatically increased demand, Rock Island Arsenal resumed production of the M1903 rifle in early 1917. However, most of the skilled workmen had long-since departed the plant when the assembly line shut down in 1913, and some problems in recruiting and



M1903 rifles being manufactured at Rock Island Arsenal.
(Rock Island Arsenal Museum)

training a new work force were encountered. Suitable raw materials were also in short supply due to the production of weapons by other U.S. manufacturers. Springfield Armory still had a trained cadre of workmen in place when production was substantially increased, but shortages were also encountered at that facility.

In order to speed production, some components were slightly modified to reduce machining time including elimination of the serrations on the trigger and checkering on the buttplate. None of these had any significant impact on the utility of the weapon. Despite rapidly increased production schedules, there was no discernible reduction in the quality of either material or workmanship on the M1903 rifles produced at either Springfield or Rock Island during the 1917–1918 period.

The most significant change in the M1903 rifle occurred in 1918 when the metallurgy of the receiver was changed from the old case-hardened variety to a stronger double heat-treated type. The old heat treatment process occasionally resulted in fractured receivers due to brittle metal. The change in heat treatment methods occurred around serial number 800,000 for Springfield Armory '03 rifles and serial number 285,507 for Rock Island rifles. The later type are known today as "high numbered" receivers.

Another change occurred in late 1918 when parkerizing replaced bluing as the metal finish. Parkerizing was the proprietary name of a phosphate-type metal finish patented by the Parker Rust Proof Co. of Detroit, Michigan. The dull parkerizing was superior to bluing for military use, as it was a non-reflective finish and was more durable. Very few, if any, parkerized

(above) Doughboys armed with M1903 rifles in front-line positions during WWI. Note the helmet in the foreground with the jagged shrapnel hole. (U.S. Army Military History Institute)

(below) Doughboys armed with '03 rifles looking for Germans. (National Archives)

U.S. troops with '03 rifles firing on Germans. (National Archives)

M1903 rifles made it overseas prior to the cessation of hostilities. However, most blued M1903 rifles were subsequently parkerized as part of the extensive post-war overhaul programs. Pre-WWII-vintage parkerized finish typically had a blackish tint as compared to the later greenish-tinted parkerizing. Any M1903 rifle manufactured prior to the fourth quarter of 1918 was originally made with a blued finish.

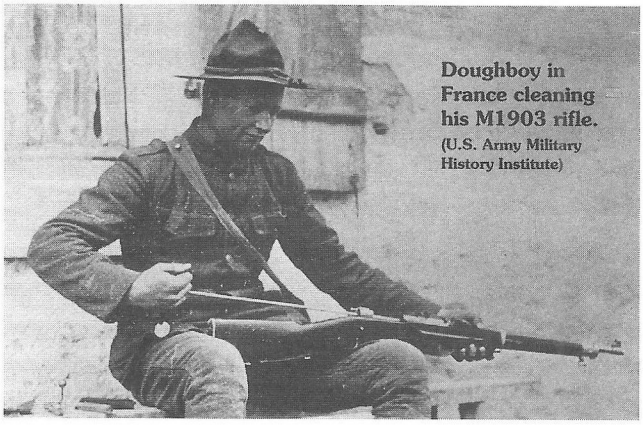
After 1917, a second reinforcing bolt (also known as a "lug" or "stock screw") was added to the M1903 rifle's stock in order to strengthen it further. The heavy recoil generated by use of the V-B rifle grenade launcher (to be discussed later in this book) in WWI was reportedly the major reason for the incorporation of the second stock bolt.

As the first contingent of Doughboys landed in France, they were carrying their reliable and accurate pre-1917-vintage '03 rifles. This accounts for the scarcity of rifles of this vintage remaining in their original configuration today. The pre-1917-vintage '03 rifles in inventory were the first ones issued and sent to France with the AEF where they saw a great deal of use. Government records indicate that in France, during the war, some 30,000 M1903 rifles were assembled from parts in ordnance shops.

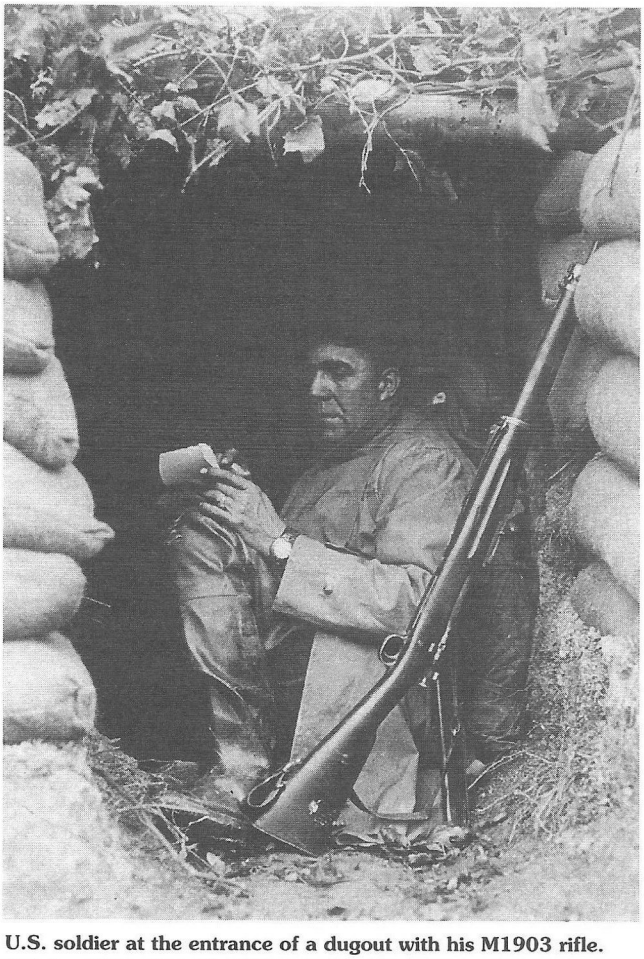
There were numerous instances recorded regarding our troops' prowess with their Springfields during the war. One typical instance is mentioned in the book *The Marine From Manatee*:

Even in the matter of defeating machine gun nests, two U.S. Army General Staff officers who had been in the thick of the fighting reported the value of accurate rifle fire. They said that in some cases American riflemen had been able to get on one or more flanks or to the rear of machine guns nests at some distance and had been able to fire their Springfields with such accuracy that the machine gunners were often shot through the head or vital part of the body...

An early contingent of Doughboys arriving in France with their '03 rifles. (U.S. Army Military History Institute)



Doughboy in France cleaning his M1903 rifle. (U.S. Army Military History Institute)



U.S. soldier at the entrance of a dugout with his M1903 rifle. (U.S. Army Military History Institute)

Accessories and Accouterments

Slings

The M1907 leather sling was the type issued with M1903 rifle at the time of the United States' active participation in WWI. Most prewar M1907 slings were produced by Rock Island Arsenal and many were stamped "R.I.A." and dated. The hardware of the WWI and earlier M1907 slings was made of brass, often blackened. The rapid surge in rifle production during the war resulted in the M1907 slings being produced under contract by a number of commercial firms. These were identical to the RIA-made slings in quality and construction. Most were marked with the identity of the maker and dated. The year "1918" dates are, by far, the most common vintage encountered today.

The M1917 Kerr "No Buckle" sling was introduced as a supplement to, or replacement for, the M1907. The Kerr sling was made of web with stamped metal hardware. The M1917 Kerr slings were authorized for use with both the M1903 and M1917 rifles although they were more commonly used on the latter. While technically correct, few M1903 rifles were issued with Kerr slings and the overwhelming majority utilized the standard M1907 leather sling. It is doubtful if any of the Kerr slings were used on rifles sent overseas and their use was likely restricted to stateside training camps.

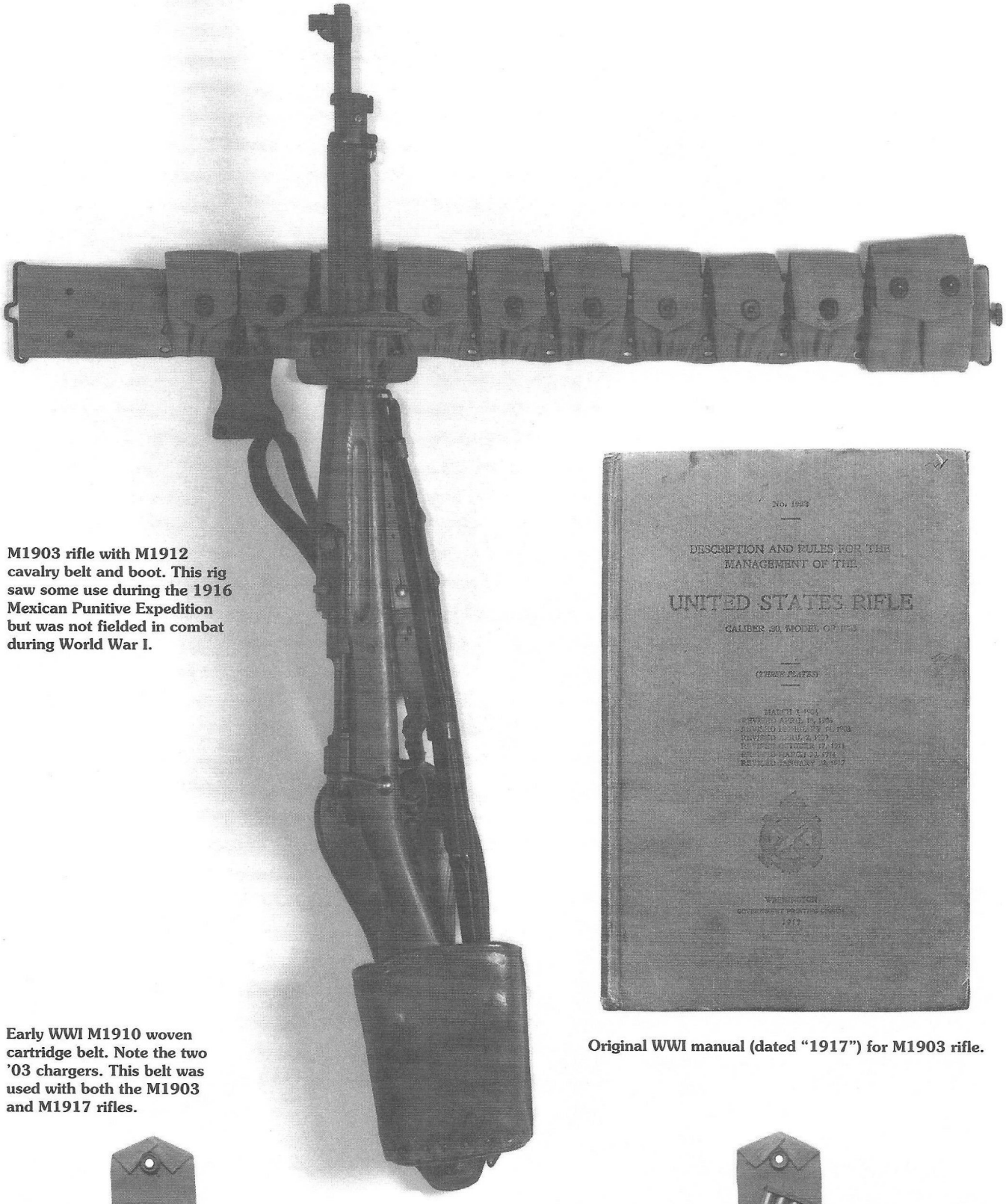
WWI-vintage M1903 Springfield rifle with M1907 leather sling.

Doughboy lighting a lantern in the entrance of a dugout. Note his M1903 rifle with M1907 sling. (U.S. Army Military History Institute)

Cartridge Belts

The M1903 rifle was issued with the M1905 bayonet and M1910 scabbard (discussed previously). The 5-round chargers were carried in the pockets of the canvas cartridge belt. Several variants of these belts were made. The belts produced prior to WWI were of Mills pattern woven construction. These were the Models 1903 (infantry), M1909 (cavalry), M1910 (infantry), M1912 (cavalry) and M1914 (cavalry). Early in WWI, the design of the cartridge belts was changed to sewn construction rather than woven in order to speed production. The sewn cartridge belts of the WWI era were the Model 1917 (infantry) and the M1918 (cavalry). In addition to the change in construction method, the buttons securing the cover flaps of the earlier woven cartridge belts were replaced by the simpler (and cheaper) "lift the dot" fasteners.

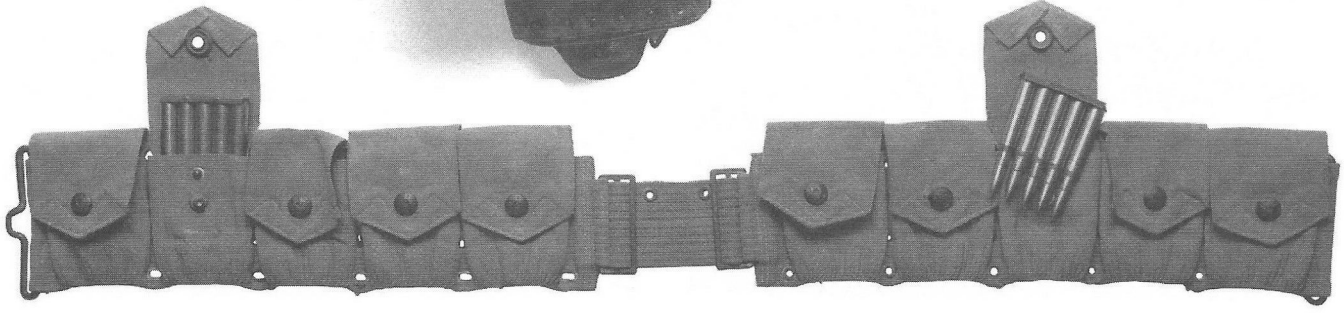
Early in the war, the woven M1910 cartridge belt was the primary type used, but large numbers of the later M1917 belt were in use by the later stages. All types of cartridge belts were equipped with grommets that were located on the lower edge for attachment of bayonet scabbards, canteens, first aid pouches, etc. Grommets along the upper edge of the belts allowed for attachment of suspenders to help distribute the



M1903 rifle with M1912 cavalry belt and boot. This rig saw some use during the 1916 Mexican Punitive Expedition but was not fielded in combat during World War I.

Original WWI manual (dated "1917") for M1903 rifle.

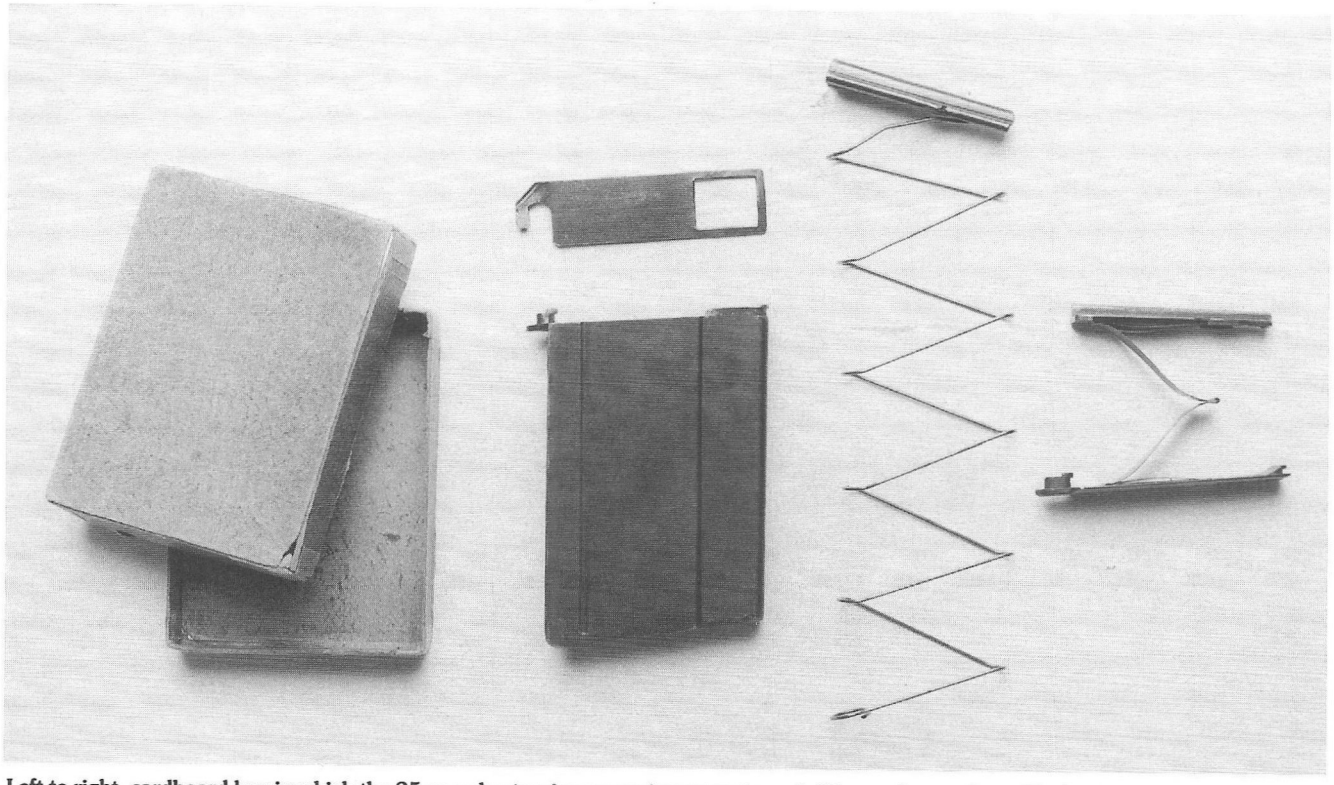
Early WWI M1910 woven cartridge belt. Note the two '03 chargers. This belt was used with both the M1903 and M1917 rifles.



U.S. soldiers in camouflage outfits with "pattern painted" M1903 rifles. Both standard M1903 rifles and '03s fitted with Warner & Swasey sights were painted in this manner. (U.S. Army Military History Institute)

Another view of camouflage outfits and "pattern painted" '03 rifles. (U.S. Army Military History Institute)

Doughboy on guard armed with a M1903 rifle and M1905 bayonet. (U.S. Army Military History Institute)



Left to right, cardboard box in which the 25-round extension magazines were issued, 25-round magazine with sheet metal cover, extension magazine spring and follower, standard '03 magazine spring and follower. The extension magazine was installed by simply removing the standard '03 floor plate and spring/follower and snapping the extension magazine in place.

weight of fully loaded cartridge belts. Identifying the WWI-vintage belts is normally quite easy, as the name of the maker and the year of production were stamped in black ink inside the belts. Those dated "1918" are the most commonly encountered.

Oiler and Thong Cases

During WWI, each M1903 rifle was issued with a nickel-plated oiler and thong case carried in the butt trap recess. One end of the case held a thong with attached brass patch holder to clean the bore and the other end consisted of an oil container secured by a screw-top with an attached dropper.

Front Sight Cover

The '03 was issued with a stamped metal cover to protect the front sight. The cover was designed to be removed before firing since the front sight blade was often partially obscured with it in place. WWI variants were unmarked and had a blackened finish.

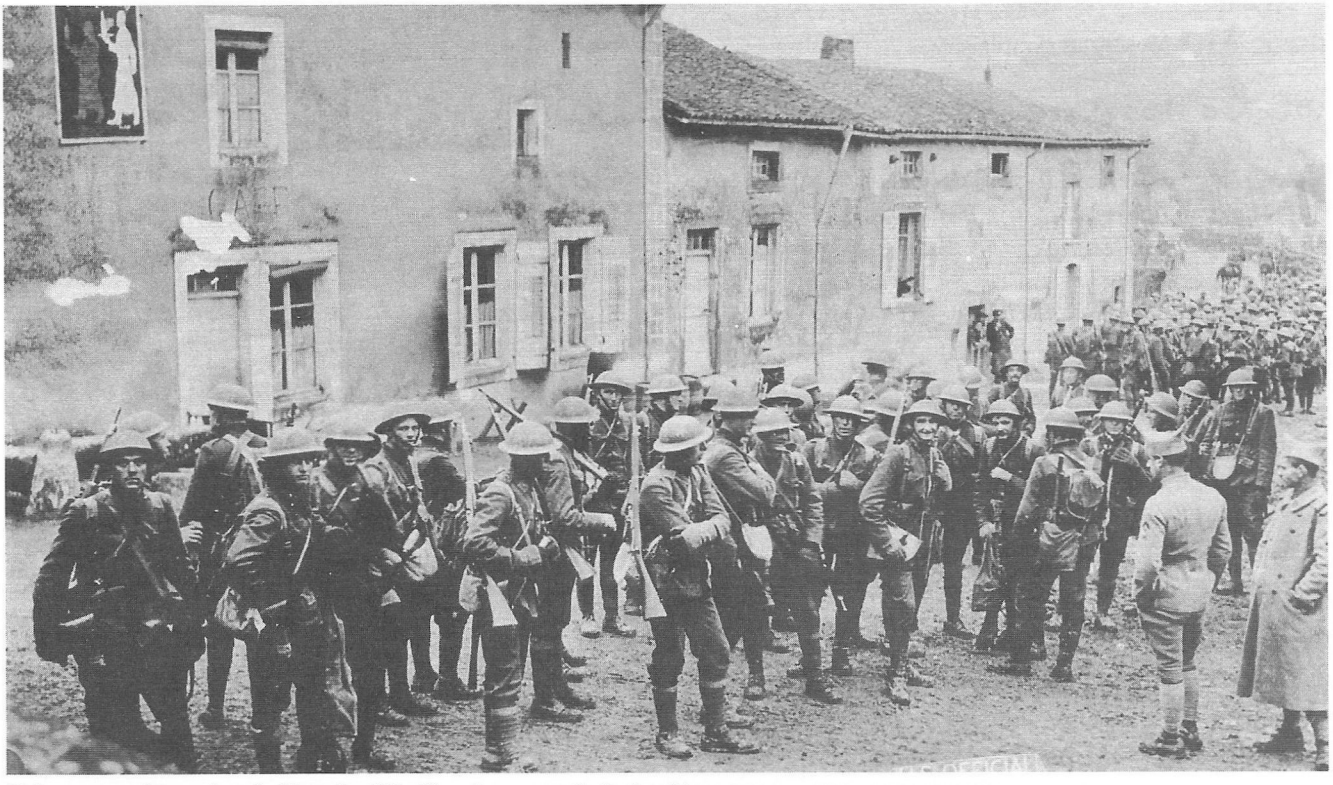
Twenty-five Round Extension Magazine

One interesting, and often misunderstood, accessory for the M1903 rifle produced in WWI was the twenty-five round extension magazine. This item was installed by removing the floor plate and follower of the standard '03 and replacing them with the extension

Close-up view of 25-round extension magazine.

Illustration from WWI Ordnance Department catalog showing a standard M1903 rifle with the 25-round extension magazine in place. This seems to refute the widespread assumption that the magazine was not intended for issue with standard '03 rifles. (U.S. Army Ordnance Department)

magazine. This increased the magazine capacity of the weapon from five to twenty-five rounds. The Germans had produced a similar extension magazine for their Mauser rifles that was fielded in fair numbers during the war. Some reference books today state that the '03 extension magazine was only intended for use with the experimental trench periscope rifles (to be profiled later) and the very limited production "Air Service" variant of the '03. While the extension magazine was used with both of these weapons, it is all but certain



U.S. troops taking a break. Note the '03 rifles slung over their shoulders. (U.S. Army Military History Institute)

that the item was also intended for general issue as well. However, the war ended before large numbers of these extension magazines made it to the front lines. The number produced was greatly in excess of the amount required for use with either of the aforementioned experimental or limited production rifles, which certainly suggests that the intent was for widespread general issue. Also, the extension magazine, attached to an unaltered standard M1903 rifle, was pictured in a WWI Ordnance Department manual. This certainly lends additional credence to the assumption that the intent was to issue the extension magazine for use with standard '03s. The ordnance publication stated that "...large numbers...have been constructed for tests..." As stated, the war ended before the tests could be concluded or the magazine issued in quantity. In certain instances, such as repelling massed infantry assaults, an extension magazine of this type could be valuable. In other instances, the protruding magazine could prevent the soldier taking the proper prone firing position and could be a hindrance. It has been reported in Ordnance Department records that an extension magazine was also produced for the M1917 rifle. Any such magazines were made in extremely limited numbers and no known specimens have been reported.

The twenty-five round '03 extension magazine is an interesting example of the various ideas that were considered to increase the rifle's utility for trench warfare.

Even though the standard M1903 was an excellent military weapon "as is," there were a number of accessories and ancillary items considered to increase the rifle's utility. Some of these, such as: specially made sniping variants with telescopic sights, grenade launchers, cut-down rifles for "air service" use, an attachment to allow semiautomatic fire, and experimental models designed to fire over the top of trenches, will be discussed later in this book.

Variant M1903 Rifles

M1903 "Air Service" Rifle

As mentioned, there was a great deal of experimentation done to increase the M1903 rifle's utility. Some of the resulting variants were only made in very limited prototype quantities and others were produced in fair numbers even though they saw little service. While not intended for use by the infantry, one of the more interesting of these modified M1903s was a variant described in a 1918 Ordnance Report as "Stripped for Air Service." Little is known regarding the disposition of these weapons but it is believed that they were intended to be used as a rudimentary form of armament for observation balloons rather than carried in airplanes. The weapon featured a standard M1903 barreled action with a special rear sight, modified front sight and a shortened stock and handguard. Sling swivels were not fitted. A twenty-five round extension magazine was attached, since cartridge belts or extra boxes of ammunition likely would not have been carried in the limited confines of a balloon basket. The "Air Service" rifles were in the 857000 to 863000 serial number range, and barrels had early 1918 dates. The actual quantity of Air Service rifles assembled varies in published reports from between 825 to 916. In June of 1925, 139 of these rifles were converted to standard M1903 configuration at the Raritan Arsenal. The remaining Air Service rifles were either converted at another facility or were destroyed. The weapon is a rare and desirable variant of the '03 and an interesting relic of the "Great War."

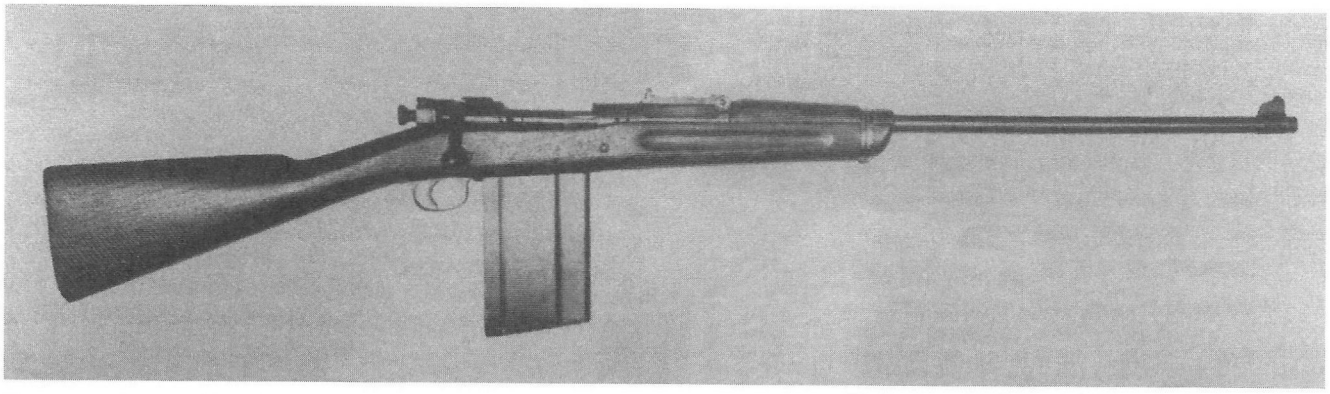


Illustration from WWI Ordnance Department publication depicting a M1903 rifle "Stripped for Air Service." Note the shortened stock and the extension magazine.

Sectionalized Rifles

There were a few '03 rifles modified by milling away portions of the metal and wood to expose the various areas of the weapon. This was done to help train armorers and similar personnel. Most of the WWI-vintage sectionalized rifles of this type were made from standard M1903 rifles. Rejected and/or condemned parts were sometimes used to assemble sectionalized rifles. The craftsmanship involved in neatly milling away specific parts of the weapon was impressive. Sectionalized M1903 rifles from both Springfield Armory and Rock Island have been observed.

M1903 Mark I Rifle

The Mark I was a standard M1903 with several modifications designed to accommodate the "Pedersen Device." The Pedersen Device will be covered later in this book, and the Mark I rifle will be discussed in that section.

M1917 "U.S. Enfield" Rifle

During the course of the war, despite the '03's unquestioned greatness, another rifle was made and issued in significantly larger numbers to the AEF. This rifle was the "U.S. Rifle, Caliber .30, Model of 1917."

As we have discussed, the declaration of war in the spring of 1917 found the United States military seriously short of all manner of modern weaponry. Although the M1903 rifle was the standard service rifle, only some 600,000 were on hand. While sufficient to arm the small prewar armed forces, this number was entirely inadequate to meet the projected increase in demand. Production was stepped up as much as possible at Springfield Armory and Rock Island Arsenal but it was clear that other sources of rifle production would be needed.

At about the time the United States declared war, three American plants were in the process of completing production of the "Pattern 1914" rifle under British contract. The Pattern 1914 was a modified Mauser design chambered for the British .303 cartridge. The rifle was manufactured by Winchester Repeating Arms Company, New Haven, Connecticut, Remington Arms Company, Ilion, New York, and an affiliate of Remington in Eddystone, Pennsylvania, later known as the Midvale Steel & Ordnance Company. Despite some inevitable friction with the British government, the three plants turned out a total of 1,235,298 Pattern 1914 rifles by the time production ceased in July of 1917.

The well-equipped plants and trained work forces that had just completed production of the P14 rifle for the British naturally attracted the attention of the Ordnance Department. The government was faced with three basic choices regarding increased procurement of service rifles:

(1) Convert the three plants from P14 rifle production to manufacture of the standard M1903 rifle.

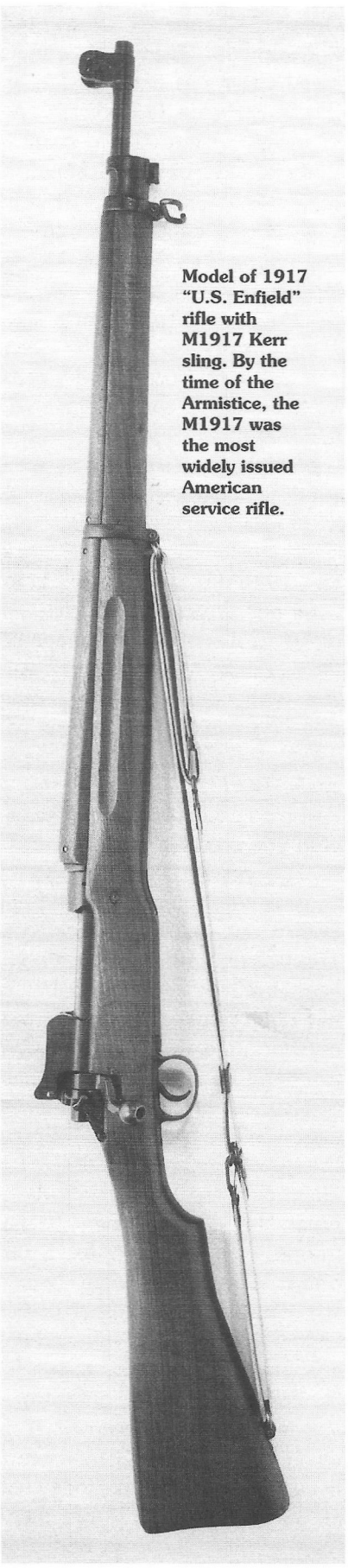
(2) Adopt the British Pattern 1914 rifle "as is."

(3) Convert the P14 rifle to chamber the U.S. .30-06 cartridge and adopt the modified arm to be issued concurrently with the M1903 rifle.

Each course of action had advantages and disadvantages. Having the three plants produce the M1903 rifle would result in keeping the tried and proven '03 as the only standard service rifle. However, it was soon determined that the lag time required to tool up and convert the production lines from the P14 to '03 would be unacceptably long. This option would result in a crippling shortage of rifles. Adopting the P14 rifle "as is" had the advantage of providing the maximum number of rifles in the minimum period of time. However, the fact that the weapon was chambered for the

Weary, mud-encrusted Doughboy and his M1917 rifle taking a break. (U.S. Army Military History Institute)

WWI Doughboy with full pack shouldering his M1917 U.S. Enfield rifle. (National Archives)



Model of 1917 "U.S. Enfield" rifle with M1917 Kerr sling. By the time of the Armistice, the M1917 was the most widely issued American service rifle.

British .303 cartridge would result in serious ammunition supply problems. Also, the .303 round was correctly viewed as being markedly inferior to the U.S. .30-06 cartridge. Essentially by default, the final option of modifying the P14 to chamber the U.S. cartridge was selected. Although it seems clear that this was the only reasonable choice at the time, the government was soundly criticized in some quarters for selecting this option. In 1919, the Assistant Secretary of War Benedict Crowell stated:

The decision to modify the Enfield was one of the great decisions of the executive prosecution of the war — all honor to the men who made it.

Secretary Crowell went on to comment that the fact that three large plants with trained workmen and equipment were available at precisely the right time to produce badly needed rifles for the American government was "...well-nigh providential."

The technical aspects of converting the British Pattern 1914 rifle to accept the U.S. .30 caliber cartridge were not particularly difficult. The P14 had a strong nickel steel action entirely capable of handling the .30-06 cartridge. Minor changes were made in the sights and rifling dimensions but, otherwise, the modified rifle was essentially identical to the British Pattern 1914, including the same type of semi-pistol grip stock. The M1917 bayonet was almost identical to the P14 type except for the markings. The bayonet is covered in a previous section of this book.

The newly adopted Model of 1917 rifle soon became widely, if unofficially, known as the "American Enfield" or, more commonly, simply the "Enfield." This was obviously in recognition of its English parentage. However, the unofficial nickname of the M1917 rifle often resulted in some confusion as to the correct nomenclature. A number of WWI-vintage reports and first-hand anecdotes refer to these rifles by a number of incorrect or misleading names such as the "Remington rifle" or "M1917 Springfield." Also, some Doughboys referred to the M1917 rifles as "British rifles" or even "British Enfields." This can cause confusion for a researcher, because some American troops were equipped for a while with the British SMLE rifles which were "true" Enfields. This can sometimes make it difficult to distinguish between the United States M1917 rifle and the British SMLE when analyzing such accounts today. In any event, the term "Enfield" is very commonly applied to the M1917 rifle and is a generally accepted, if unofficial, term today much like the M1 "Garand" rifle. It should be mentioned that some people today refer to the M1917 rifle as the "Pattern 1917" or "P17." The use of either term is totally incorrect and should be avoided. The United States never used the term "Pattern" or "P" to designate a service rifle. The only correct designations are "Model" or "M."

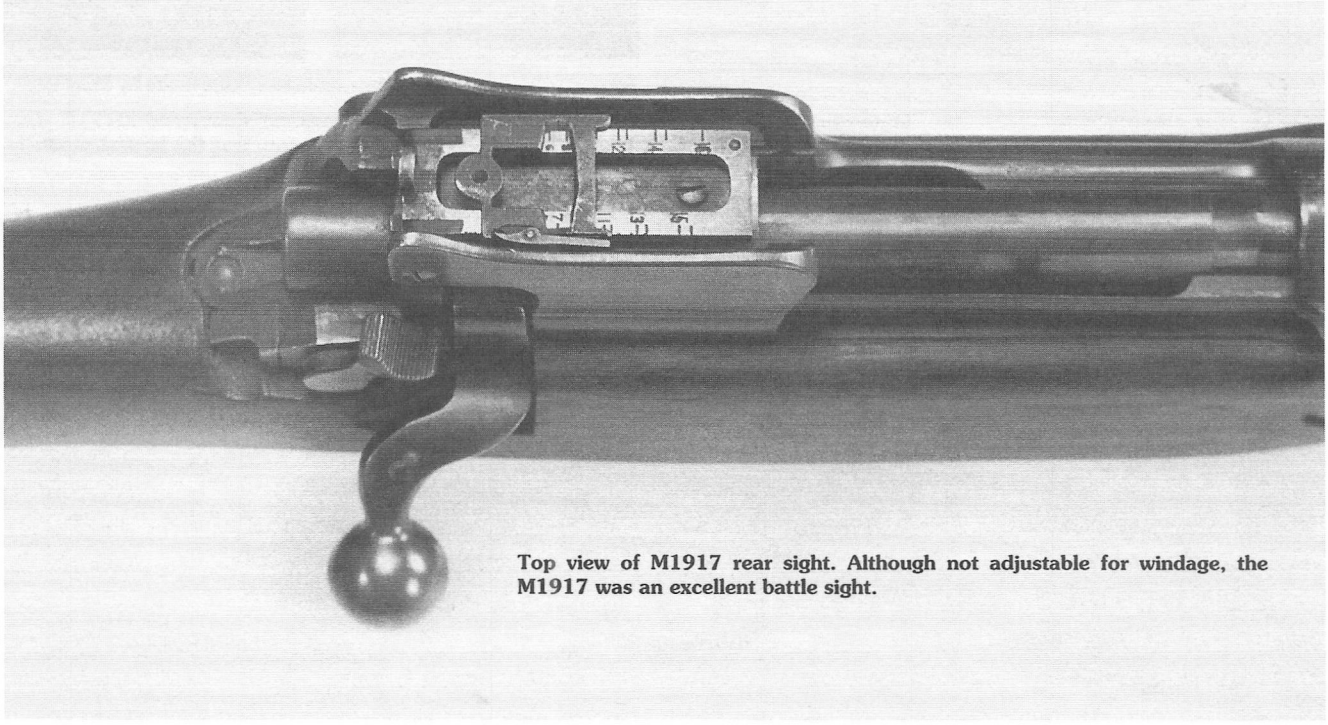
On May 10, 1917, each of the three contractors submitted a sample of a M1917 rifle to Springfield Armory for evaluation and testing. The main problem encountered was that the rifles contained many hand-fitted components which resulted in the substantial lack of interchangeability of parts. It was noted that a bolt made by one contractor would not even fit into the receiver made by another contractor. This situation gave the Ordnance Department another dilemma with which to wrestle. Total interchangeability of parts was obviously desirable, but it would take precious time to delay immediate production and concentrate on achieving this goal. Despite the tremendous demand, the Ordnance Department chose to delay immediate mass production and consult with the various engineering staffs to improve the interchangeability problem. On July 12, 1917, each contractor submitted a second rifle. These subsequent rifles reflected some improvement regarding the interchangeability of parts but were still deemed unsatisfactory. However, the government gave each manufacturer the option of proceeding with mass production immediately and work on the interchangeability problem in due course or wait until standardized manufacturing drawings were completed. Remington and Eddystone chose to wait for the final drawings, but Winchester elected to proceed immediately. The Assistance Secretary of War remarked later that:

It would have been well if the same course (wait for final specifications) had been followed at the Winchester plant for word came later from Europe not to send over any rifles of Winchester manufacture during that period.

Eventually, the standardized production specifications and drawings were completed, and the firms began to tool up for large-scale production of the M1917 rifle. The Ordnance Department came to the conclusion that total interchangeability of parts would be extremely difficult to achieve without seriously slowing production. It was deemed that a 95 percent interchangeability rate would be acceptable, and this percentage was eventually achieved by all manufacturers. The above-mentioned problem with very early Winchester M1917 rifles was soon solved, and the weapons subsequently made by that firm were equal to the Remington and Eddystone rifles in this respect.

The M1917 rifle as made by all three firms was 46.3" in overall length with a 26" barrel. The rifle weighed 8.18 pounds and had a magazine capacity of six rounds. The same type of 5-round charger

U.S. troops of the 366th Infantry Regiment, 3rd Battalion, 92nd Division, undergoing gas mask training at Vosges, France, August 8, 1918. Note the M1917 rifles. (National Archives)



Top view of M1917 rear sight. Although not adjustable for windage, the M1917 was an excellent battle sight.

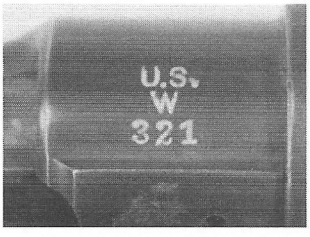
(i.e., "stripper clip") used with the '03 rifle was also utilized with the M1917. This meant that the five rounds were generally carried in the magazine even though it had the capacity for another round. The rear sight was a folding leaf adjustment for elevation (but not windage) mounted on the rear of the receiver. The front sight consisted of a blade with two protective "ears" on either side. The stock and two-piece handguard were constructed of black walnut with an oil finish. There were some minor differences found in the configuration of the grasping grooves (sometimes incorrectly called "finger grooves") of the stocks. The external metal parts were rust blued.

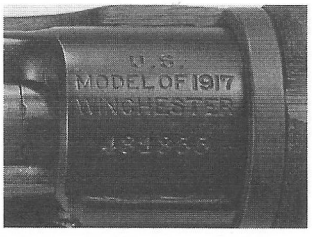
The action cocked on the closing of the bolt rather than on opening, as was the case with the '03. The bolt handle of the M1917 had a noticeable "crooked" appearance. This was done to bring the bolt handle in close proximity to the trigger for more rapid manipulation of the action. Despite a rather odd appearance as compared to the conventional curved bolt of the '03, the location of the M1917's trigger was viewed as a definite advantage. One Ordnance Department report claimed that the M1917's bolt design allowed for the rifle to be fired twice as fast as the German Mauser's straight bolt action. As stated in the report:

To put it another way, by bending back the bolt handle we had placed two men on the firing line where there was only one before...

This statement is certainly open to challenge, but the M1917's bolt design did, indeed, place the trigger

M1917 rifle receiver area. Note the "crooked" bolt handle designed to be in close proximity to the trigger. Note also the protective "ears" on the rear sight.



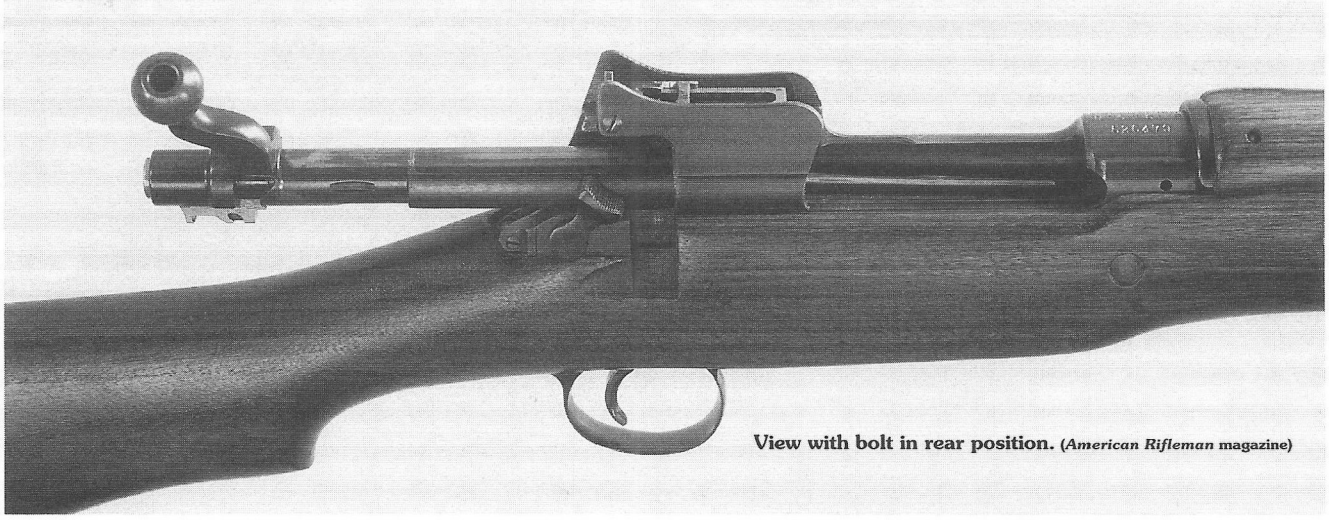


(above, left) Receiver marking on very early production Winchester M1917 rifle. Note the "W" denoting the manufacturer and the serial number 321. (Hayes Otoupalik collection)

(above, right) Receiver markings on later Winchester M1917 rifle.

(above, left) Receiver markings on M1917 rifle made by Remington.

(above, right) Receiver markings on Eddystone M1917 rifle. Eddystone, a subsidiary of Remington, was the largest producer of M1917 rifles.



View with bolt in rear position. (*American Rifleman* magazine)

quite close to the bolt handle and undoubtedly aided in manipulation of the action.

The receiver ring was marked "U.S./Model of 1917/maker/serial number", and the barrel was marked on top (behind the front sight) with the initials of the maker ("R", "W" or "E"), a "flaming bomb" insignia and the month and year of production. The receiver ring of extremely early production Winchester rifles was only marked with the initial of the manufacturer (i.e., "W") as was the case with the British P14 rifles. M1917 serial numbers began with "1" and were numbered sequentially. Most of the components, including the front tip of the stock, bolt, rear sight and safety, were stamped with the initial of the maker. The stock was normally stamped with an "eagle head" inspector's marking similar to those found on some World War I vintage M1911 .45 pistols.

Unlike the M1903, the M1917 rifle did not have a magazine cut-off. Consequently, the follower blocked the closing of the bolt when the magazine was empty. This created some awkwardness during close order drill and when manipulating the rifle during inspection. To correct this situation, a stamped sheet metal magazine depressor was made and issued for use with the M1917 rifle. Winchester factory records indicate that the firm made 215,512 of these "magazine platform depressors."

As the final production glitches were worked out, ever-increasing numbers of M1917 rifles were flowing from the three plants. Changes in the assembly line and other refinements resulted in much faster (and cheaper) production of the M1917 rifle as compared to very similar Pattern 1914s made by the same manufacturers. As an example, the average number of P14 rifles assembled daily by one worker was 50, but the average number of M1917 rifles assembled during a day was 250, with some workers assembling as many as 280. Also, the average price paid by the British government for a Pattern 1914 rifle was $42.00, but the average price of the M1917 paid by Uncle Sam was only $26.00. Obviously, the three firms did an amazing job of substantially boosting production while markedly reducing the manufacturing time and unit price of the M1917 as compared to the P14. Even though all three manufacturers were faced with shortages in material and labor, M1917 rifles continued to be turned out in staggering numbers during the course of production.

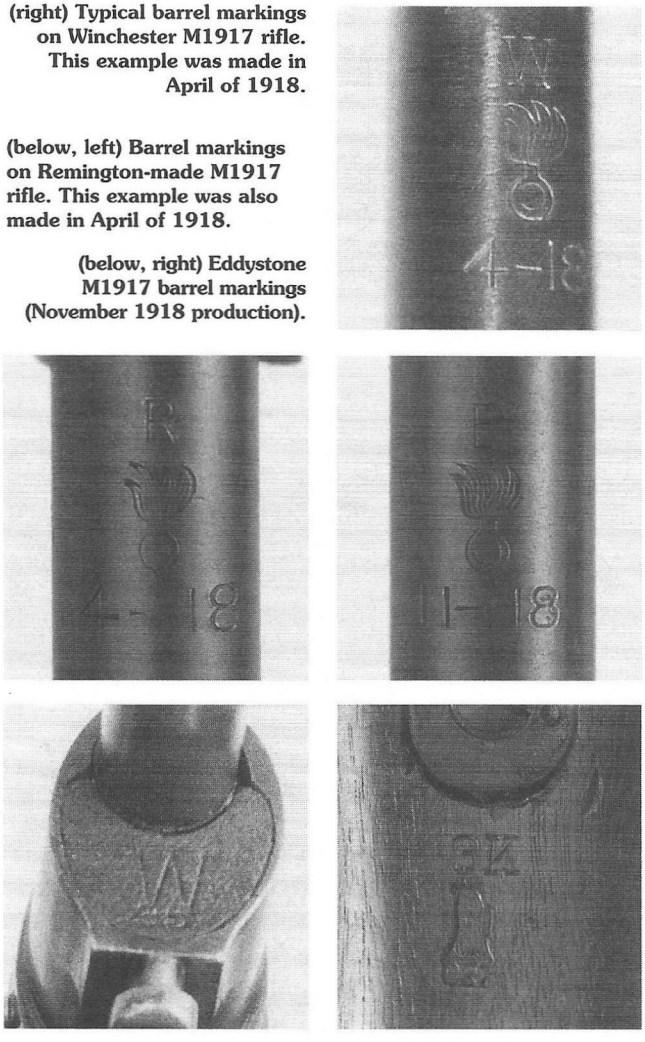
The completed M1917 rifles were assembled and sent to France as fast as the availability of shipping allowed. Large numbers were issued stateside in the training camps as well. While a serviceable design, the M1917 rifle was not as popular with most Doughboys as was the M1903. Some of the prejudices against the Enfield were based on the initial unfamiliarity of the design such as the "cock on closing" feature and the lack of a cut-off to function as a magazine depressor. Other complaints against the weapon were more legitimate. The M1917 weighed over a pound more than the Springfield and was three inches longer, which obviously made it a less handy "package." The '03 was better balanced with superior handling qualities. The Springfield was also slightly more accurate than the M1917, but the difference was not substantive for the average soldier.

However, the American Enfield also had some advantages over the '03. The rear-mounted sight was a much better sight for battle purposes than the

(right) Typical barrel markings on Winchester M1917 rifle. This example was made in April of 1918.

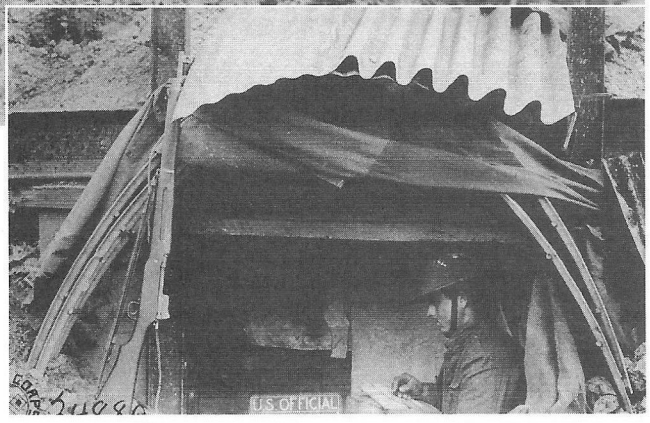
(below, left) Barrel markings on Remington-made M1917 rifle. This example was also made in April of 1918.

(below, right) Eddystone M1917 barrel markings (November 1918 production).



(above, left) Manufacturer code on tip of M1917 rifle stock. This example was manufactured by Winchester. Remington stocks were marked "R" and Eddystone stocks marked "E" in this area.

(above, right) Typical inspector's marking on M1917 stock. The "eagle head" marking is common to several WWI-vintage U.S. military weapons including the M1917 rifle and M1911 .45 pistol. Note the "3K" marking above the "eagle head" and the smaller "027" code marking below the "eagle head."



(above) U.S. troops "on the march" with their M1917 rifles passing through a badly damaged French village during WWI. (National Archives)

(right) Doughboy in dugout entrance. Note his M1917 rifle close at hand. (U.S. Army Military History Institute)

Springfield's sight. The lack of windage adjustment was not a serious detriment, and the position of the sight (close to the eye) was better than the '03's barrel-mounted sight for combat purposes. The M1917 was as good or better than the '03 for bayonet fighting due to the slightly longer "reach" due to the additional length of the rifle and bayonet. The position of the safety was preferred by many users over that of the '03.

While most Doughboys would have selected an '03 over the M1917 if afforded the opportunity, the adopted British rifle was nevertheless a strong, robust and reliable weapon that was the equal, or superior, of any other rifle of the era used by either our allies or adversaries. It is interesting to note that the most famous Doughboy of them all, Alvin York, used an American Enfield rather than the '03 (the Hollywood movie on the subject notwithstanding). There are numerous instances cited regarding York's employment of the M1917 rather than the '03 including a reference in his diary. Laurence Stallings related the following in his book *The Doughboys:*

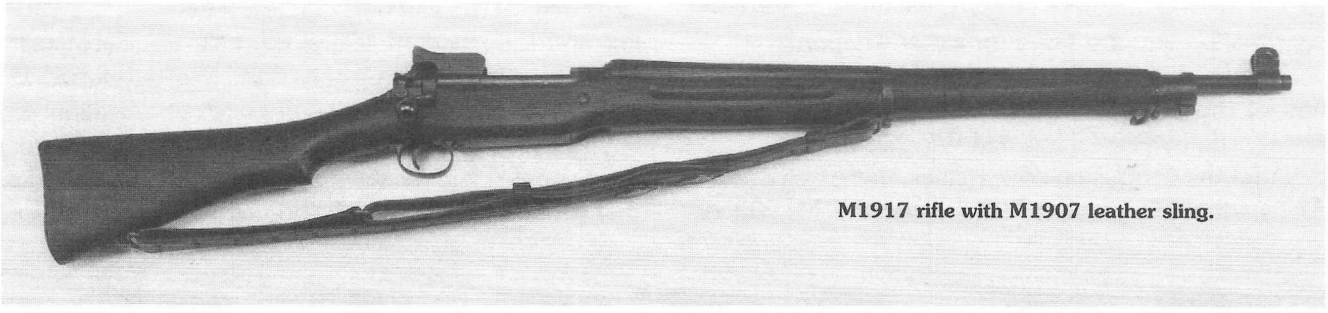
York now holstered his pistol and thumbed a fresh clip into his Enfield... It was difficult for York's Germans to discern whence came this murderous fire. What ear could distinguish the well-aimed single shots of an American-modified Enfield rifle amidst the chatter...

While much of the credit for his amazing exploits

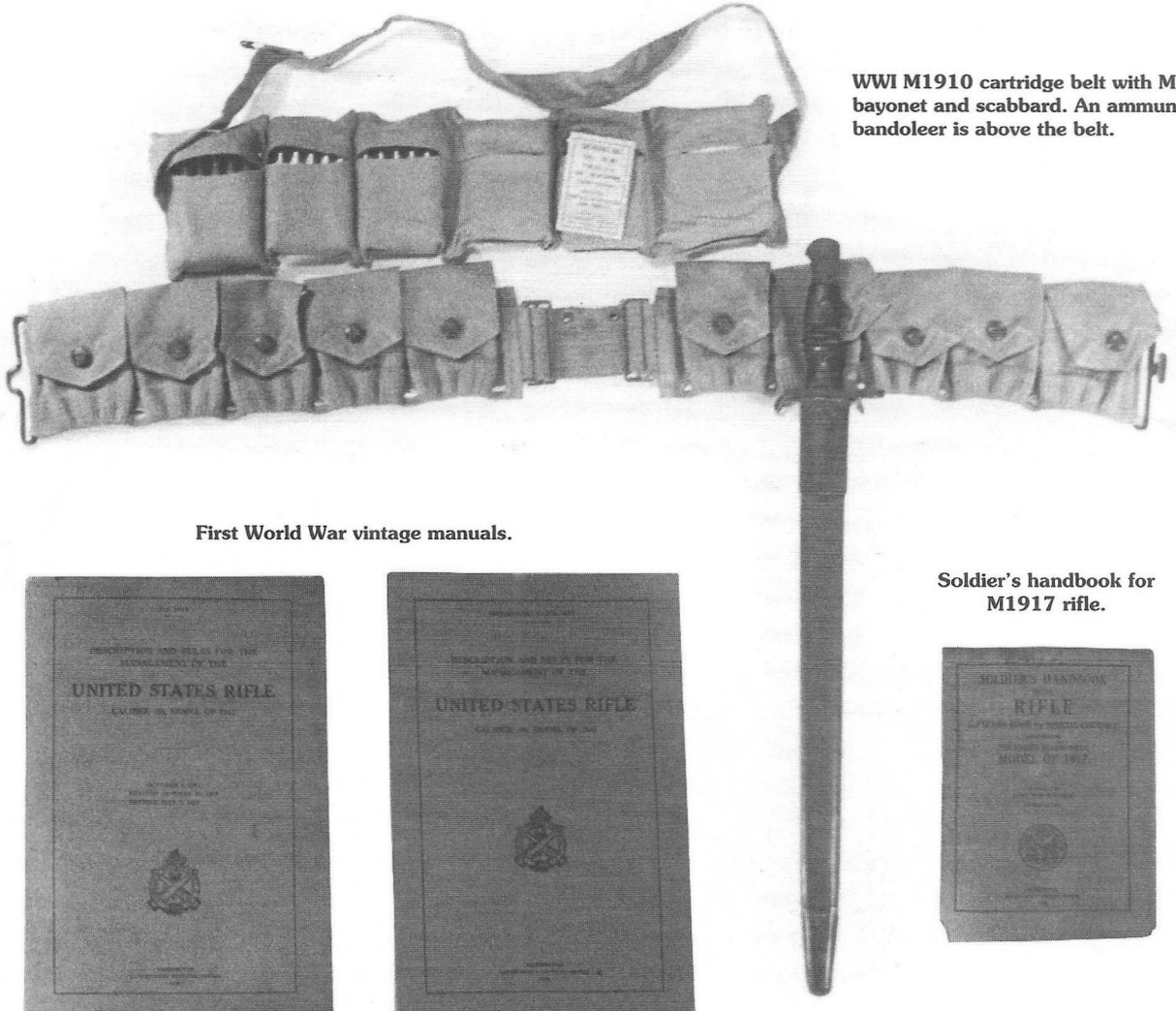
can be given to York's phenomenal marksmanship, the M1917 rifle was obviously capable of more-than-adequate accuracy. Whether he had an American Enfield or an '03, a Doughboy was armed with a dependable and reliable service rifle. While the '03 is typically thought of as *the* U.S. rifle of WWI, the M1917 was actually the predominate infantry weapon by the end of the war. In fact, it is estimated that some 75 percent of all American troops were armed with the M1917 rifle at the time of the Armistice.

Accessories

The M1907 leather sling as used with the M1903 was also standardized for use with the M1917 rifle. Sometime after adoption of the M1917 rifle the Kerr "No Buckle" sling was approved as an alternative to the M1917. The Kerr sling was constructed of web-bing and was simpler and cheaper to produce than the leather and brass M1917 sling. The Kerr sling was also approved for use with the M1903 rifle as well but was most often used with the M1917. As stated, it



M1917 rifle with M1907 leather sling.



WWI M1910 cartridge belt with M1917 bayonet and scabbard. An ammunition bandoleer is above the belt.

First World War vintage manuals.

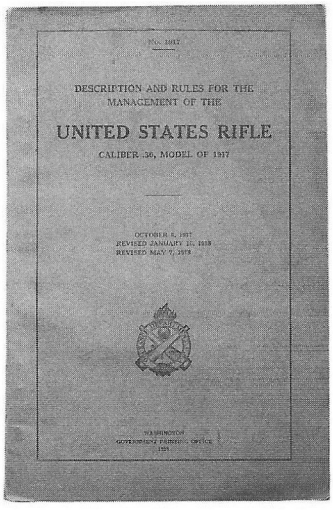
Soldier's handbook for M1917 rifle.

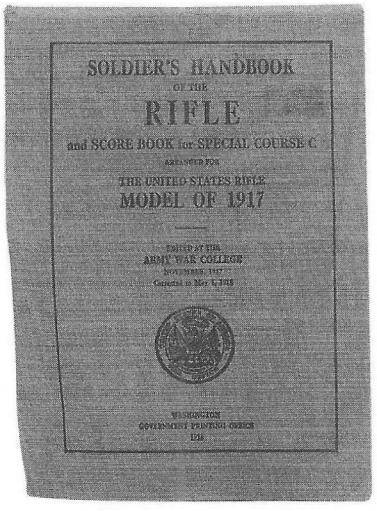
appears that use of the Kerr sling was primarily restricted to stateside and few, if any, of the slings were sent to France before the end of the war.

The same type of cylindrical metal oiler and thong case as carried in the butt trap recess of the M1903 was issued with the M1917 rifle as well. The same type of cartridge belts was issued with the M1903 and M1917 rifles. The use of common accessories such as slings, oiler/thong cases and cartridge belts simplified quartermaster supply problems. Since the same type of .30-06 cartridges and 5-round chargers were used for the M1903 and M1917 rifles, the ammunition supply situation was the same for either weapon.

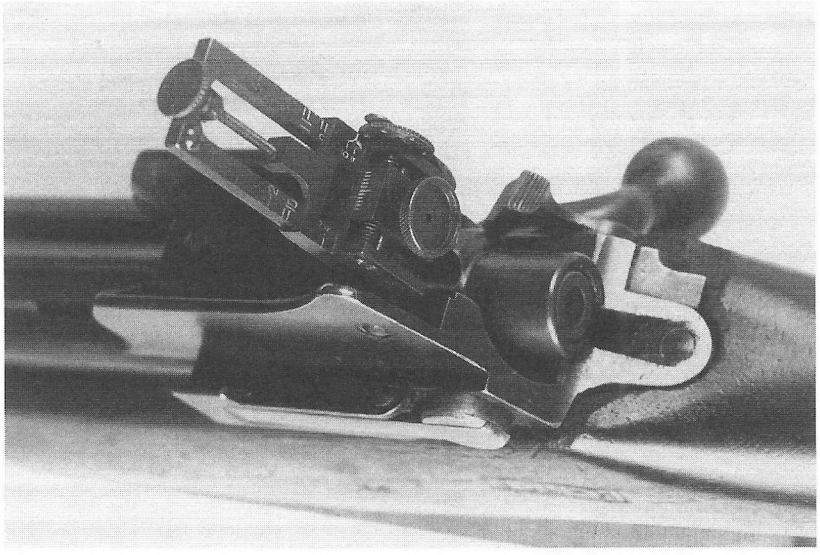
The M1917 bayonet is covered in a previous section of this book. As stated there, M1917 bayonets were made by Remington and Winchester.

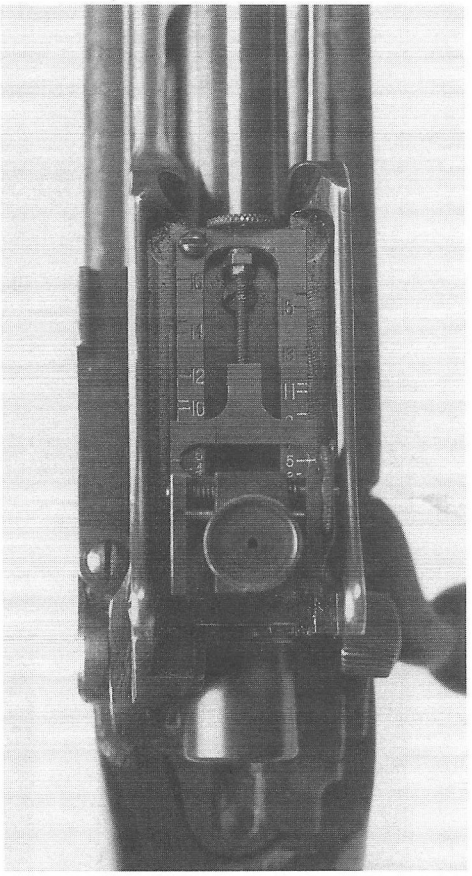
After the conclusion of hostilities, there was a great deal of thought given to which rifle, the M1903 or M1917, should be retained as standard and which should be retired to the war reserve stockpile. The Enfield had proven to be a serviceable rifle, and there were much larger numbers on hand as compared to the Springfield. However, the fact that the M1917's rear sight was not adjustable for windage was not popular with competitive shooters. There were a relatively small number of M1917 rifles produced with a rear sight capable of fine adjustments for windage and elevation. Not much is known regarding this variant, but all examples noted were manufactured by Remington circa mid-1918. The only difference between this variant and the standard rifle is the fully adjustable rear sight. It is possible that this sight was developed in order to have a rifle capable of match competition. In any event, the lack of a fully adjustable standard rear sight coupled with postwar labor troubles in the plants that produced the M1917 doomed standardization of





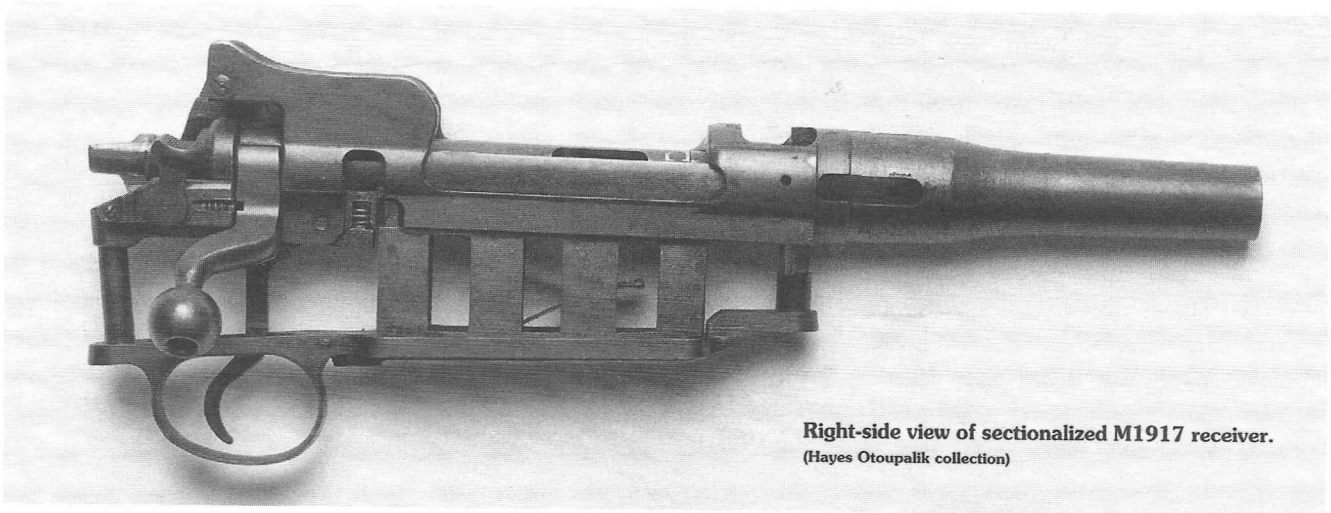
Alternative view of WWI M1917 manual and soldier's handbook. Both examples are dated "1918."



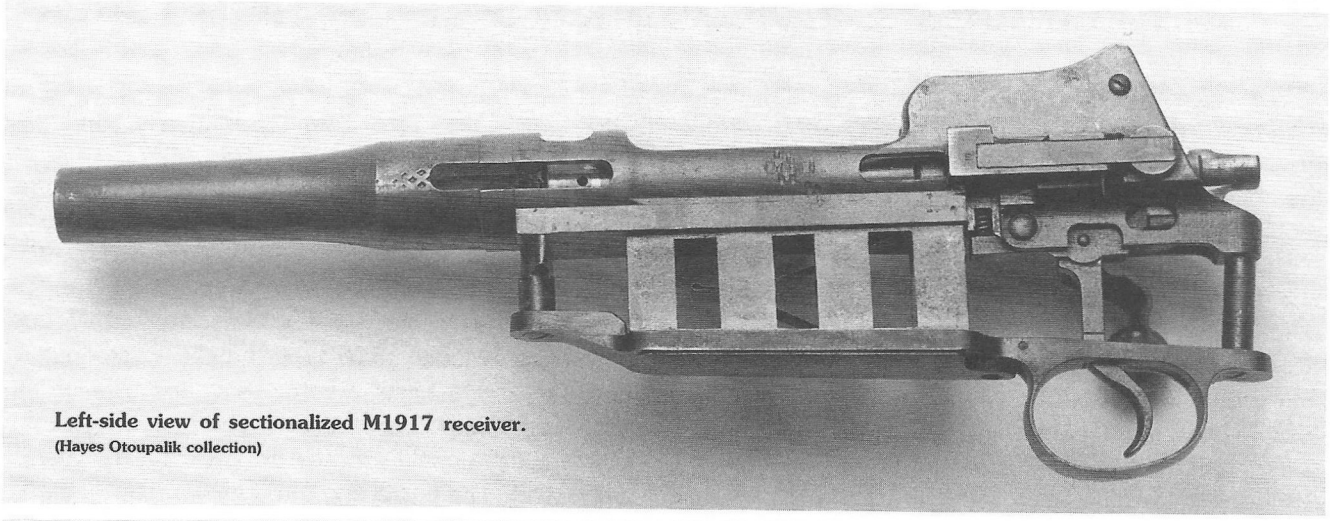


(above) Experimental M1917 rear sight in folded position. Note the peep aperture in the round disk and the knurled elevation knob at the top of the leaf.

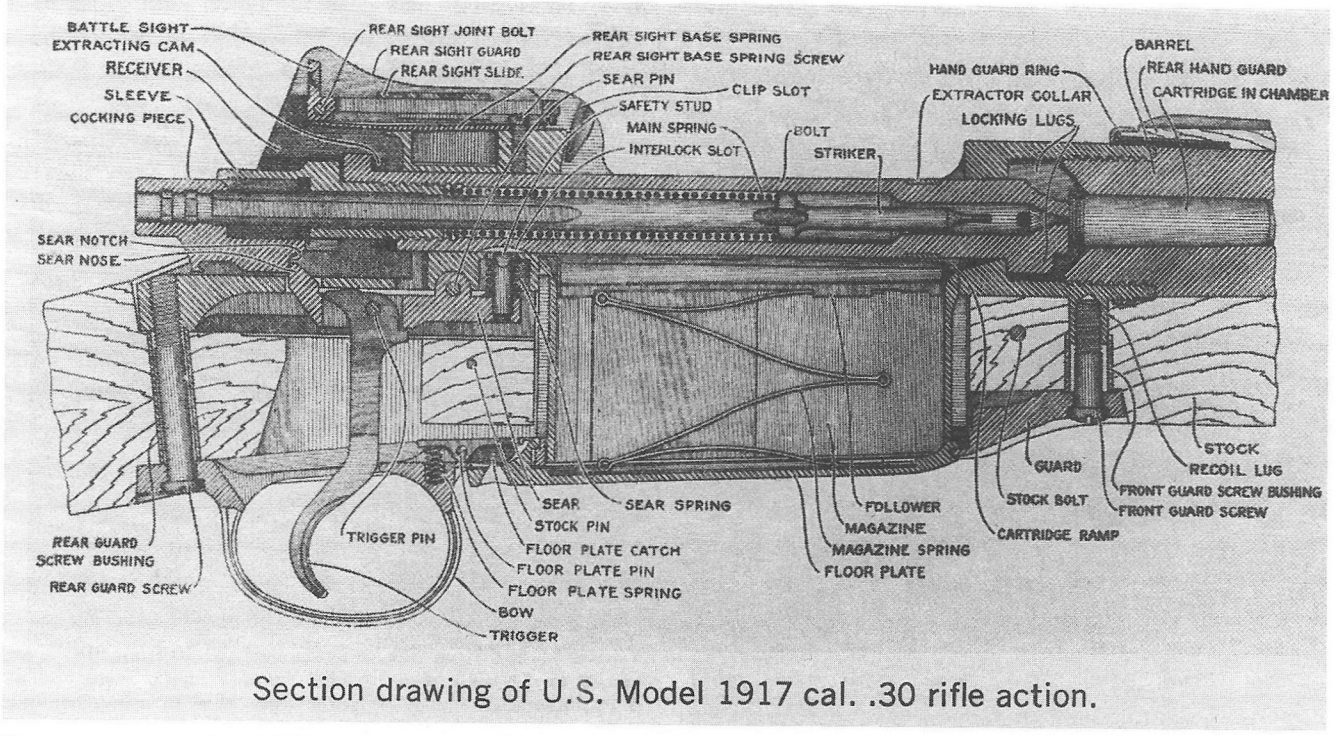
(left) Scarce experimental M1917 rear sight capable of fine adjustments for elevation and windage. These sights were factory fitted to a small number of Remington M1917 rifles during WWI. Sight leaf is in the raised position.



Right-side view of sectionalized M1917 receiver.
(Hayes Otoupalik collection)



Left-side view of sectionalized M1917 receiver.
(Hayes Otoupalik collection)



Section drawing of U.S. Model 1917 cal. .30 rifle action.

Drawing of sectionalized M1917 rifle action. (*American Rifleman* magazine)

the weapon, and the M1903 was retained as standard issue following the war.

Winchester records reflect that the company produced 28 "skeletonized" (sectionalized) M1917 rifles. Some were undoubtedly made by Remington and Eddystone as well, but documentation confirming the number is not available.

There were also several sniper variants of the M1917 rifle developed during the First World War period. These will be discussed in a subsequent section of this book dealing with sniper rifles.

Many M1917 rifles were refurbished and placed into long-term storage following the end of World War I. Large numbers of these rifles were recalled into service during WWII to meet foreign military aid requirements and as supplemental service rifles and training weapons for the U.S. military.

Despite suffering from the NIH (Not Invented Here) syndrome, the M1917 rifle provided very valuable service to the United States during a critical time. Anyone desiring proof of the American Enfield's ability to function as a first-line military rifle need look no further than Alvin York's exploits. The M1917 rifle was a weapon literally "in the right place at the right time." It's a good thing for the United States that this was the case.

Supplemental Service Rifles and Training Rifles

U.S. Krag Rifle

While the M1903 and M1917 rifles represented the "state of the art" for military service rifles during the First World War, the exigencies of wartime required the utilization of some obsolescent, if not obsolete, rifles by the U.S. military. An example of this was the use of M1898 or M1896 Krag-Jorgensen rifles used for training purposes during WWI. The Krag was the standard U.S. Army service rifle from 1894 until the adoption of the M1903 rifle. The M1898 was the final variant of the Krag rifle, and some 330,000 were manufactured by Springfield Armory between the years 1898 and 1903. The Krag was the standard U.S. Army service rifle during the Spanish-American War. Battle use revealed a number of deficiencies that directly led to the development of the Mauser-influenced M1903 Springfield rifle.

The Krag rifle was 49.1" in overall length with a 30" barrel. The weapon weighed 9.3 pounds. The Krag was chambered for the ".30-40" cartridge. The Krag's cartridge had a 220 grain bullet with a muzzle velocity of 2,000 f.p.s. that was markedly inferior to the .30-06 cartridge. Unlike the '03 and M1917 rifles, the Krag could not be loaded by means of a charger ("stripper clip"), and the individual cartridges had to be loaded one at time. This was one of several features that resulted in the Krag being replaced by the '03. The left side of the receiver was marked "Model 1898" (or "Model 1896") — "U.S." — "Springfield Armory" and a serial number. The left side of the stock was stamped with a cartouche consisting of the initials of Springfield's master armorer and the year of production. The barrel and furniture were finely blued, and the receiver was case hardened with typically a grayish tint. The Krag was issued with the M1892 bayonet and scabbard (discussed previously), a leather sling and a woven looped cartridge belt.

At the time of America's active involvement in World War I, there were about 160,000 Krag rifles on hand at various ordnance depots. These Krag rifles were soon taken out of storage and issued stateside at

(above) M1898 Krag rifle. A number of .30-40 Krag rifles were issued in the early days of WWI for training purposes and as supplemental service rifles. None were used in actual combat, although several thousand were sent to France during the war.

(left) Typical receiver markings on M1898 Krag rifle.

U.S. Army soldiers armed with Krag rifles during the First World War. The troops are undergoing inspection by an officer. (National Archives)

several U.S. Army training camps. In 1917, the government procured a quantity of newly manufactured .30-40 Krag ammunition. This ammo was issued in the same type of cloth bandoleers as the standard .30-06 ball ammunition. The original .30-40 Mills-type woven loop belts were sometimes used during this period although many recruits trained with standard M1903, M1910 or M1917 cartridge belts.

Although inferior to the '03 or M1917, the Krag was adequate for training purposes, even though its handling characteristics were markedly different from either of the standard rifles. While most trainees would have preferred a Springfield or Enfield, it was better than training with a broomstick, which would likely have been the alternative if Krags weren't available. After the U.S. military was fully equipped with M1903 and M1917 rifles, the Krag was withdrawn from service. A number of them were kept in storage for potential future use.

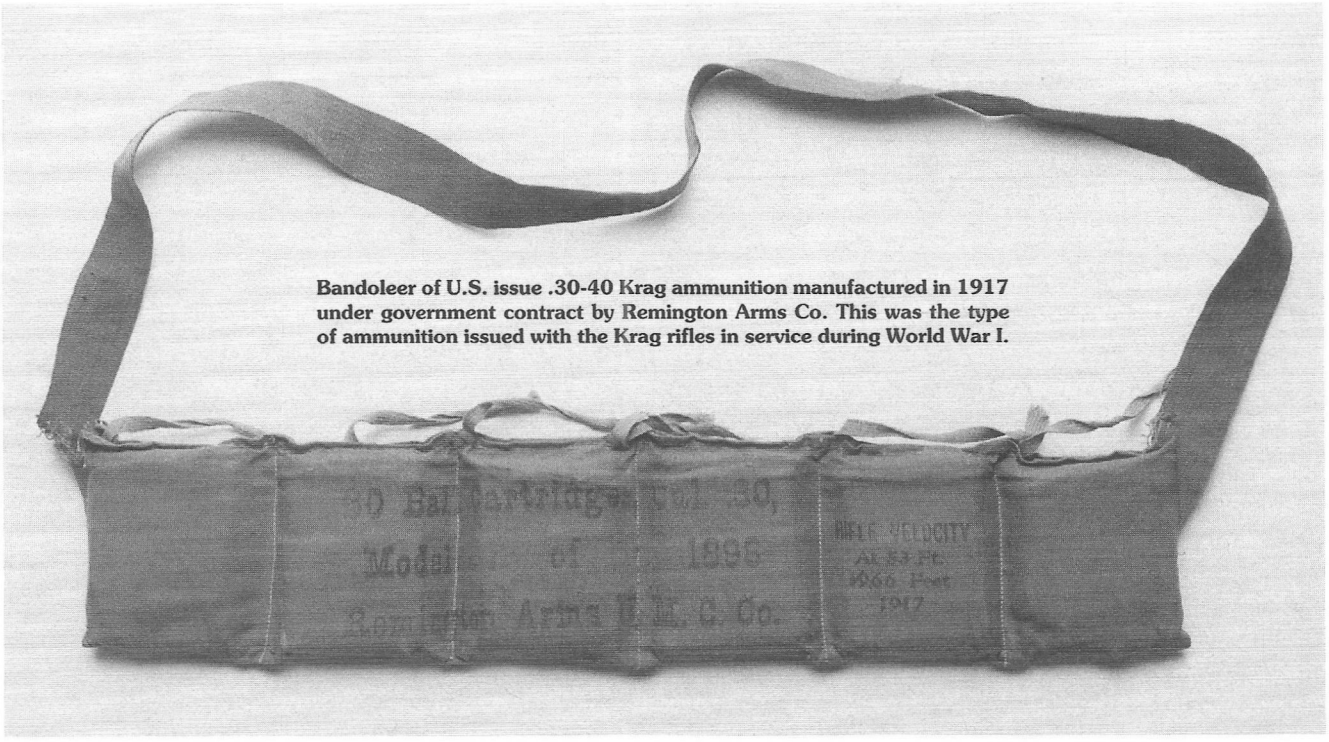
One Doughboy's reaction to being issued a Krag rifle is related in the marvelous book *Make the Kaiser Dance:*

...When we first arrived at Camp Dix, we were shown several cartons of old rifles and told to clean them up. After wiping all the grime off, we saw (they were) Krag-Jorgensens. This was the standard weapon of the Spanish-American War. After we trained with these for several weeks, they gave us Springfields — then, just before we left, American Enfields were issued...

An Ordnance Department report stated that 2,000 Krag rifles (primarily the M1898 model) were taken to France by the 10th–19th Engineers (Railway) but there is no evidence that any were used by front-line combat units. However, it is known that some of the Railway Engineer units came under hostile fire, so some combat use of the U.S. Krag rifle during WWI cannot be entirely ruled out. Any such use, however, would have been quite limited. The Krag rifles were shipped back to the United States in late 1917 and early 1918. As stated by General Hunter Liggett in his postwar memoirs:

All of our divisions went across (to France) with their own rifles, though some had to be equipped with obsolescent Krag-Jorgensens temporarily.

In addition to those utilized by the Army, some Krags rifles (and bayonets) were issued to U.S. Navy



Bandoleer of U.S. issue .30-40 Krag ammunition manufactured in 1917 under government contract by Remington Arms Co. This was the type of ammunition issued with the Krag rifles in service during World War I.

personnel serving in France during the war. Most of these were also presumably withdrawn from service before the Armistice.

As the supply of Springfields and Enfields increased, virtually all of the Krags were withdrawn from service before the end of the war. When the Krags were totally retired from service, most were disposed of on the surplus market or sold to members of the National Rifle Association, through the auspices of the Director of Civilian Marksmanship.

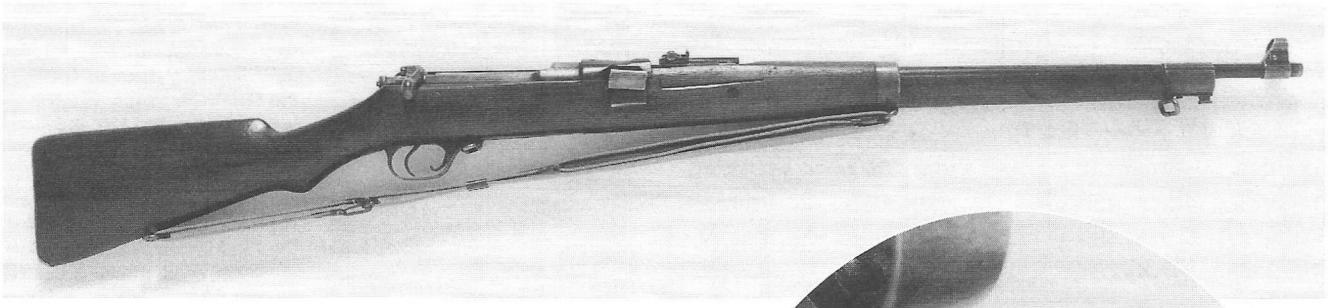
While the Krag's service during the Spanish-American War is well known, many people are not aware of the role played by the weapon during the First World War. The utilization of Krags enabled much larger numbers of Springfields and Enfields to be available for the use of front-line combat troops than would have been possible otherwise. Although our Doughboys did not have to face the Germans while armed with Krags, the rifle nevertheless provided yeoman-like service for training use. The rifle's role during WWI, limited as it was, should be noted.

Ross Rifle

In addition to the Krags reposing in Uncle Sam's warehouses, the U.S. Army acquired some Mark II Ross rifles from the Canadian government. The Canadians were aware of the United States' shortage of service rifles and indicated that they had some 100,000 Mark I and Mark II Ross rifles available for purchase. The Ross rifle had recently been withdrawn from front-line by the Canadians due primarily to the unsuitability of its straight pull bolt action mechanism to cope with the mud-encrusted environment of the trenches. Some Ross models also allowed for the bolt to be improperly assembled, which could result in deadly consequences. The Canadians mounted some of their Ross rifles with M1913 Warner & Swasey sights for sniping use. The weapon was inherently quite accurate, and the Canadian snipers were reportedly very fond of their Ross rifles. This was in direct contrast to the poor opinion the average Canadian infantryman held regarding the Ross.

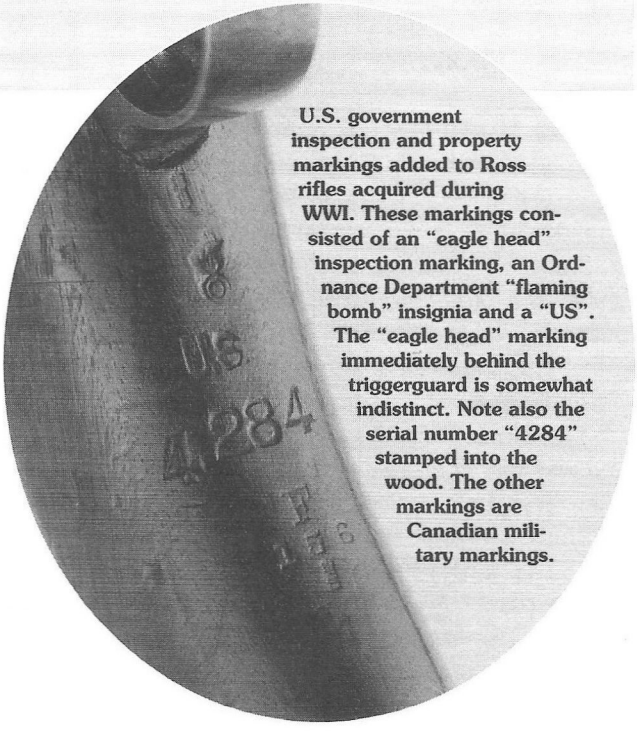
The Ross weighed about 9 pounds, 14 ounces and had a 30.5" barrel and an overall length of 50.25". The weapon was chambered for the standard British .303 cartridge having a muzzle velocity of approximately 2,600 f.p.s. The Ross' magazine was fitted with an unusual thumb lever mounted on the right side that could be depressed to make loading easier. The rifle was equipped with a barrel-mounted tangent sight similar to the type used on the German M98 Mauser. All metal parts were blued, and the stock and handguard were made of a decent grade of wood. The front sight was protected by a removable metal cover.

On November 17, 1917, the U.S. War Department procured 20,000 Mark II Ross rifles complete with bayonets, scabbards, slings and oil bottles for $12.50 each. The government subsequently purchased 4,629,470 rounds of .303 ammunition (at $20.00 per thousand) and a quantity of spare parts (cost



Mark II Ross rifle, caliber .303. The U.S. War Department purchased 20,000 of these rifles from the Canadian government during WWI for training use. This example is fitted with a U.S. M1917 Kerr sling as were most of the rifles of this type acquired by the U.S. Army.

(below) Typical receiver markings on Mark II Ross rifle.



U.S. government inspection and property markings added to Ross rifles acquired during WWI. These markings consisted of an "eagle head" inspection marking, an Ordnance Department "flaming bomb" insignia and a "US". The "eagle head" marking immediately behind the triggerguard is somewhat indistinct. Note also the serial number "4284" stamped into the wood. The other markings are Canadian military markings.

$7,814.78) along with 2,000 Ross rifle manuals. Half of the Ross rifles were sold (at cost) to the state of New York for "defense purposes" ("state guard" units). The remaining rifles were divided between Camp Devens, Massachusetts (5,000 rifles), and Camp Sherman, Ohio (5,000 rifles). In addition to these 20,000 rifles, in March of 1918 the Canadian government loaned 200 Mark II Ross rifles to the U.S. Junior Naval Reserve. It is believed these rifles were returned to Canada after the war.

The left side of the receiver was marked "Ross Rifle Co. Quebec, Canada 1905" (over) "Patented". Unit markings were typically stamped on the right side of the stock between the grip and butt. Interestingly, the rifles were not marked with serial numbers on the metal, but a serial number was generally stamped on the bottom of the stock between the grip and trigger. The Ross rifles procured by the U.S. Army were stamped with a "US" and "flaming bomb" markings on bottom of the stock in this same general location to denote United States government ownership.

The rifles were fitted with swivels allowing for attachment of the sling in one of two different locations. It is interesting to note that the original Ross slings were generally replaced by M1917 Kerr slings when the rifles were issued for U.S. service.

The Ross rifles acquired by the U.S. Army were utilized for training purposes until sufficient numbers of M1903 and M1917 rifles could be acquired. After the war, many of the Ross rifles were declared surplus and sold to NRA members for $5.00 each. They were not big sellers, and the price was later reduced to $3.50. In 1926, sales were suspended altogether due to complaints from the purchasers. The rifles not sold were kept in storage by the government and were subsequently transferred back to the Canadians around

Mark II Ross rifle with bayonet attached.

1940 under provisions similar to "Lend-Lease." Some were still in their original WWI-era Canadian packaging when transferred back across the border.

Like the Krags, the Ross rifles were not used in combat by American troops. Little has been recorded regarding their utilization by the stateside training camps, but they likely provided satisfactory, if unremarkable, service.

M1891 Mosin-Nagant Rifle

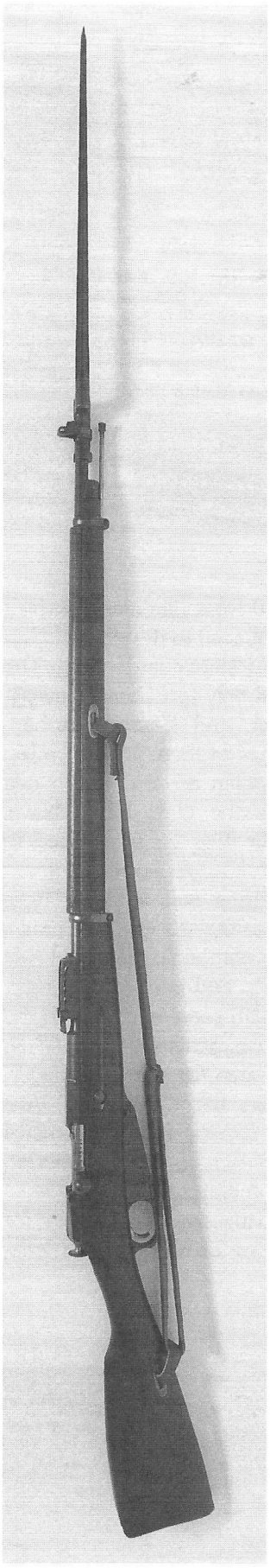
In addition to the Krag and Ross rifles, which provided useful service within the confines of stateside training camps, another rifle was procured by the United States for training and supplemental use. However, unlike the other two arms, this weapon saw actual overseas combat in the hands of American infantrymen. This interesting weapon is the Russian M1891 Mosin-Nagant rifle.

The Mosin-Nagant was adopted by Russia in 1891 and was that country's first smokeless powder military rifle. The bolt action rifle was chambered for a 7.62mm cartridge with a muzzle velocity of 2,800 f.p.s. The Mosin-Nagant was 51.3" in overall length with a 31.6" barrel. The weapon weighed 9.63 pounds. The rear sight was graduated in "arshins" rather than yards or meters. A cleaning rod was housed in a recess in the stock under the barrel. The stock was inletted in two places for leather loops that permitted attachment of a sling.

The M1891 Mosin-Nagant was issued with an all-metal, socket-type bayonet. No scabbards were produced as the bayonet was intended to be mounted on the rifle at all times. The Mosin-Nagant bayonet is profiled in a previous section of this book.

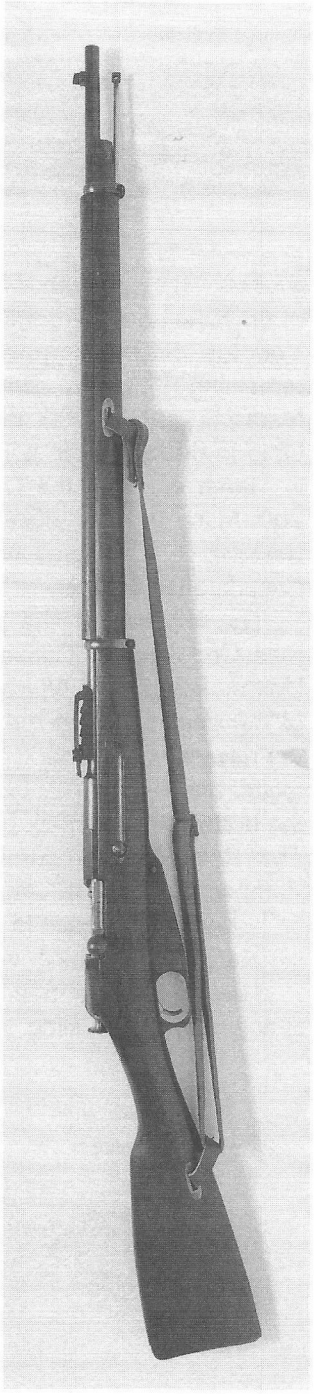
When Russia entered the First World War, the country faced a shortage of rifles. In 1915, the Czarist government in Russia placed orders for just over a million M1891 rifles with two American firms, Remington Arms Company and New England Westinghouse Company. The two firms began to tool up to produce the Russian rifle as fast as possible, and deliveries began in 1916. There were, however, some frustrating difficulties encountered during the Mosin-Nagant's U.S. production run. Harold L. Peterson relates some of the problems experienced by Remington in his book *The Historical Treasury of American Guns*:

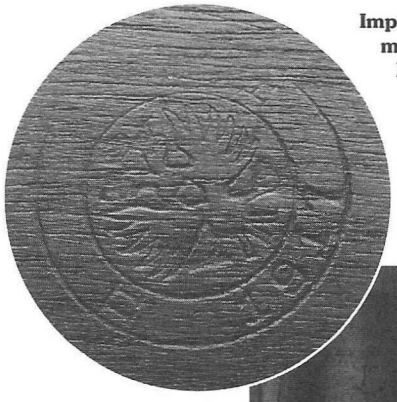
No sooner had the British contract (for Pattern 1914 rifles) come under control than another of the allies came to Remington asking for arms to help fight the enemy, this time it was Russia, and the Czar's government also wanted a million rifles... If the British contract had gone smoothly,



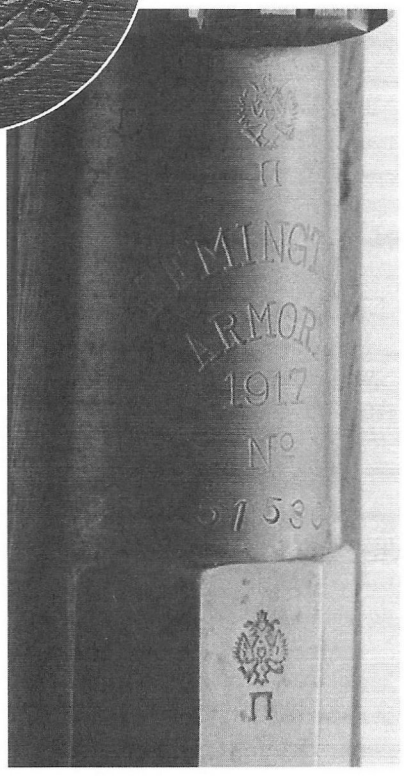
(left) WWI Mosin-Nagant rifle with bayonet affixed. Unlike most military rifles of the era, the Mosin-Nagant was normally carried with the bayonet attached.

(below) M1891 Mosin-Nagant rifle as manufactured during the First World War. A number of these rifles were acquired by the United States government after the fall of the Czar and used for training purposes and as supplemental infantry weapons.

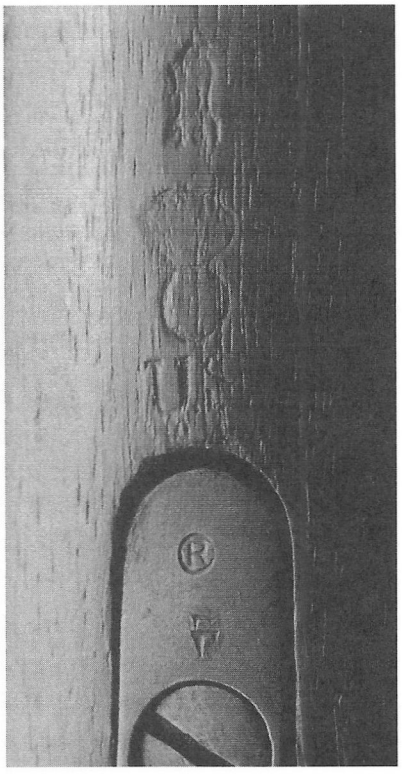




Imperial Czarist inspection marking on stock of M1891 Mosin-Nagant rifle. Note the "1917" date of production.



Typical receiver markings on M1891 Mosin-Nagant rifle manufactured by Remington Arms Company under contract for Czarist Russia in 1917. Note the Imperial Russian crests below the serial number and above the "Remington" marking.



United States government property and inspection markings added to Mosin-Nagant rifles procured during World War I. These markings consisted of an "eagle head" inspection mark (similar to those found on M1917 rifles), an Ordnance Department "flaming bomb" insignia and a "US" marking. Note also the small circled "R" indicating production by Remington Arms Company.

the Russian contract was the exact opposite. The official blueprints, master models and gauges all differed from one another. Inspectors and fitters went mad trying to put parts together and test them. Every rifle had to be fitted by hand, with time-consuming filing and shaving. Instead of 2,000 arms a day, the Bridgeport plant was turning out 125. It was failing to meet its agreed deliveries and it was losing a great deal of money in the process. This was an impossible situation. Remington engineers reworked the official Russian standards and finally obtained official approval from the Czar's representatives.

Even though Remington was able to standardize the confusing array of Russian engineering drawings and specifications, the company still experienced problems due to mettlesome and uncooperative inspectors sent over from Russia to "supervise" the Mosin-Nagant production program. Peterson discusses this situation and an amusing "pay back" contrived by the Remington production staff.

...there were still other hurdles — fifteen hundred of them, in fact. These were the host of official inspectors sent by the Russian government to make sure that the rifles were made according to specifications. Each one inspected as if his life depended on it. They got in each other's way and, more important, they got in the workmen's way and so succeeded in delaying the production.

It was a trying situation for the Remington gunsmiths, and company tradition still fondly recalls the comeuppance meted out to one of the most obnoxious of the Czar's minions. This was one Cossack captain, who appeared at the plant each day attired in full regalia with fur hat, flowing coat, red leather boots, crossed bandoliers and a gold-sheathed dagger. He was so spectacular that the men promptly dubbed him "Alexander the Great." In time, the workmen got to accept the fancy costume, but they mightily resented his particular specialty in inspecting arms. Alexander had a dread fear of accidental rifle discharges caused by jars or shocks. To make sure that the Remington-made Mosin-Nagants were safe from this hazard, he would seize finished arms, load and cock them, then slam the butts on the concrete floor with all his might. He never did succeed in getting a rifle to fire accidentally, but he broke an awful lot of stocks trying.

Human endurance can stretch just so far. Finally the Remington gunsmiths decided they had had enough, and that Alexander should be taught a lesson. They took a newly finished rifle and filed

the sear nose so it barely held the hammer cocked. True to form, Alexander loaded and cocked the piece, poised it and slammed it to the floor. The rifle went off with a bang magnified hundreds of times by the reverberations inside the building. The bullet whistled up past Alexander's face — and punctured a 4-inch high-pressure water pipe directly above his head! As Alexander instinctively glanced up after the bullet, he caught the full force of the gushing water in his face. It is doubtful that a 7.62mm bullet could have done more to douse his enthusiasm, but stories grow with the telling, especially good stories. And the Remington one hears the Russian was knocked off his feet and that laughing workmen had to drag him to safety to keep him from being drowned!

Despite technical and human difficulties, Remington eventually got the Russian contract under control...

Similar difficulties were experienced at the New England Westinghouse plant, but eventually both plants were turning out large numbers of Mosin-Nagant rifles for the Russian government. The fall of the Czar caused the cancellation of contracts by the two American firms. By the time production ceased, Remington had produced some 750,000 Mosin-Nagant rifles and New England Westinghouse a similar number. A total of 469,951 M1891 Mosin-Nagant rifles had been sent to Russia by February of 1917 (prior to the Bolshevik revolution), and the remaining rifles remained on hand at the two plants. Both firms were faced with serious financial difficulties due to the untimely termination of the Russian contracts. In order to keep the two valuable arms-making firms viable so that they could produce badly needed weapons for Uncle Sam, the United States government agreed to purchase a total of approximately 280,000 Mosin-Nagant rifles from the two companies at a reported $20.00 each. This allowed Remington and New England Westinghouse to retain their trained work forces, and soon both firms were given orders to produce other weapons for the American government. Each company eventually produced the M1917 Browning machine gun, and Remington also turned out large number of M1917 rifles as well as some M1910 military shotguns.

The U.S.-made M1891 Mosin-Nagant rifles were well-crafted weapons. The barrels, receivers and most external metal parts were finely blued, and the wood and handguards were made of a good grade of walnut. The name of the maker (i.e., "Remington Armory"), the year of production ("1917") and the serial number were marked on top of the barrel between the rear sight and receiver ring. Many components were stamped with the serial number of the rifle. An Imperial Russian crest, including the date of production, was stamped on the right side of the stock.

The Mosin-Nagant rifles taken into United States service were surcharged with a "U.S.", "flaming bomb" and "eagle head" inspector markings stamped on the bottom of the stock forward of the magazine.

It has been reported that the M1891 Mosin-Nagant was adopted as substitute standard by the United States and given the designation "U.S. Magazine Rifle, Model of 1916." However, War Department or Ordnance Department documentation to confirm this has not been discovered.

Fairly large numbers of the U.S.-made Mosin-Nagant rifles were issued for training use at several U.S. Army bases. Some were also allotted to the Student Army Training Corps (SATC) that was established during the war as an adjunct to the ROTC. The SATC program was discontinued soon after the Armistice.

The M1891 was rather awkward due to the overall length of the rifle and the long bayonet. Although, as mentioned, the Mosin-Nagant's bayonet was intended to be affixed at all times, it was often removed during training in order to make the weapon easier to handle.

In addition to its use as a training rifle, a number of Mosin-Nagants saw action in the hands of American troops that participated in the North Russian campaign. This campaign is often forgotten today. Troops from several nations, including the United States and Great Britain, were deployed to Russia in the late summer and early fall of 1918 in order to guard the large quantity of supplies at Murmansk and Archangel. The initial fear was that the fall of the Czar would permit the Germans to establish a presence in this area. After the Armistice, however, the German threat subsided but was replaced by insurgent actions of the newly empowered Communists. The Americans did not really want to become mired in a war in North Russia against the Communists. However, there were a number of frequently bloody combat engagements between the Americans and Russian Communists from late 1918 until our troops were finally withdrawn in August of 1919.

In order to simplify the supply situation, our troops sent to North Russia were armed with Mosin-Nagant rifles. There were vast stocks of 7.62mm Russian ammunition stored in allied warehouses in the area, which made utilization of the Mosin-Nagant rifle logical. Units of the U.S. Army including the 339th Infantry of the 85th Division were armed with Mosin-Nagant rifles while stationed in Russia. Some U.S.

Navy personnel assigned to the Siberian campaign were also armed with the rifles.

The Mosin-Nagant was not very popular with the American soldiers who were used to the M1903 and M1917 U.S. rifles. Konrad Schreier, Jr. states:

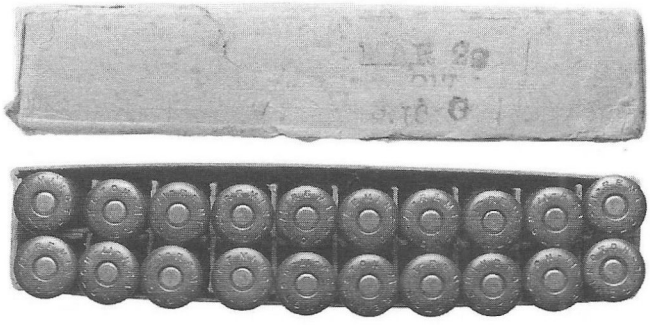
The U.S. troops who used these rifles (Mosin-Nagants) said they were "adequate" but not nearly as good as the U.S. Army Springfield or Enfield service rifles.

Many of the Mosin-Nagant rifles used by our troops were turned over to the non-Communist "White Russians" after we departed.

A number of Mosin-Nagant rifles (reportedly made by Remington) were also issued to the "U.S. Guards," a militia unit stationed at border points in the Northeastern U.S. such as Ft. Niagara. Other home guard and non-federalized state guard units were also issued Mosin-Nagant rifles during this period.

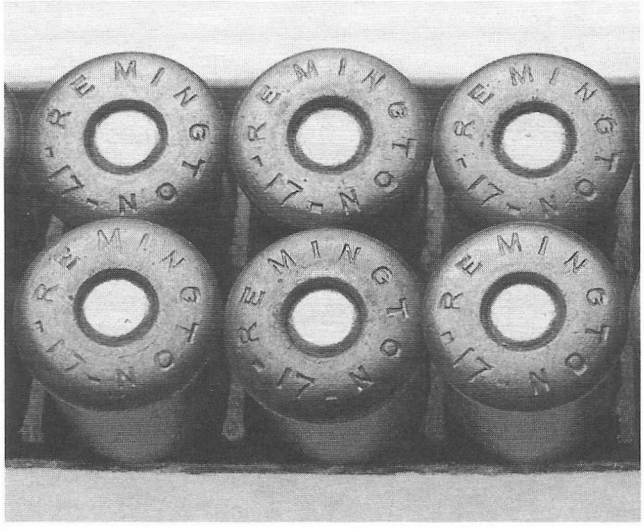
It is interesting to note that at least one prototype "Pedersen Device" (discussed later in this book) was made for the M1891 Mosin-Nagant rifle as well as a V-B grenade launcher (also covered subsequently). However, neither accessory was put into production.

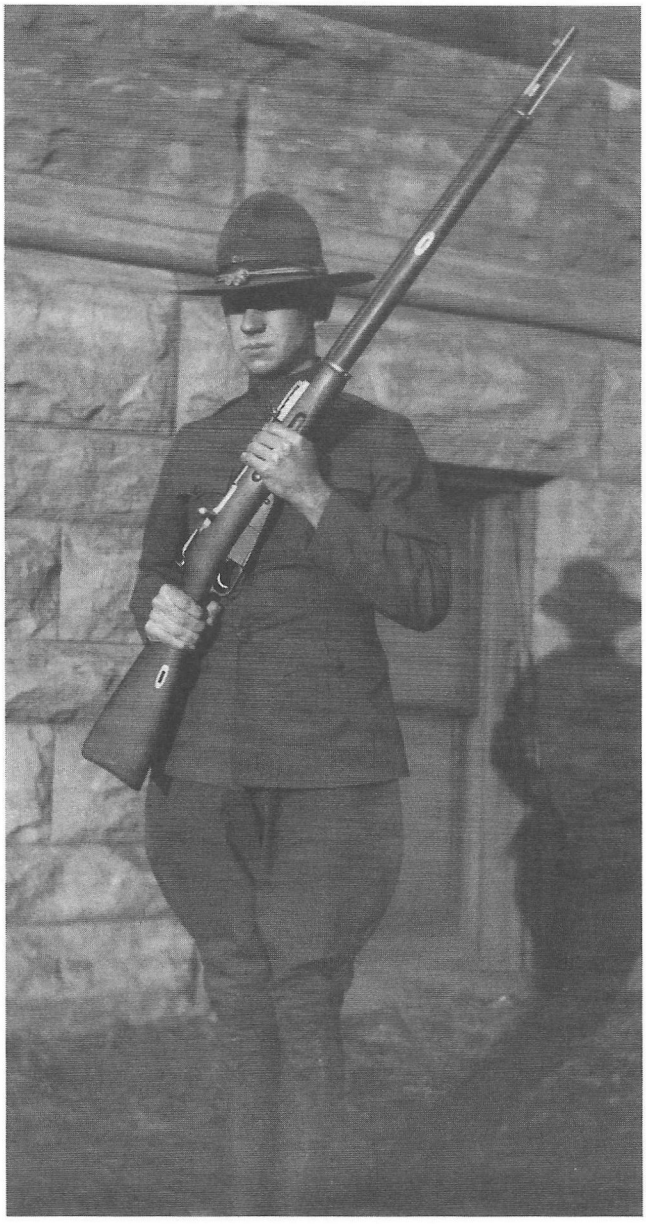
Following the conclusion of World War I and the subsequent North Russian expedition, the Mosin-Nagant rifles in the United States' inventory were declared as surplus. Some 25,000 or so of the weapons were sold through the Director of Civilian Marksmanship. The rifles were only marginally popular with civilian shooters. Some were subsequently



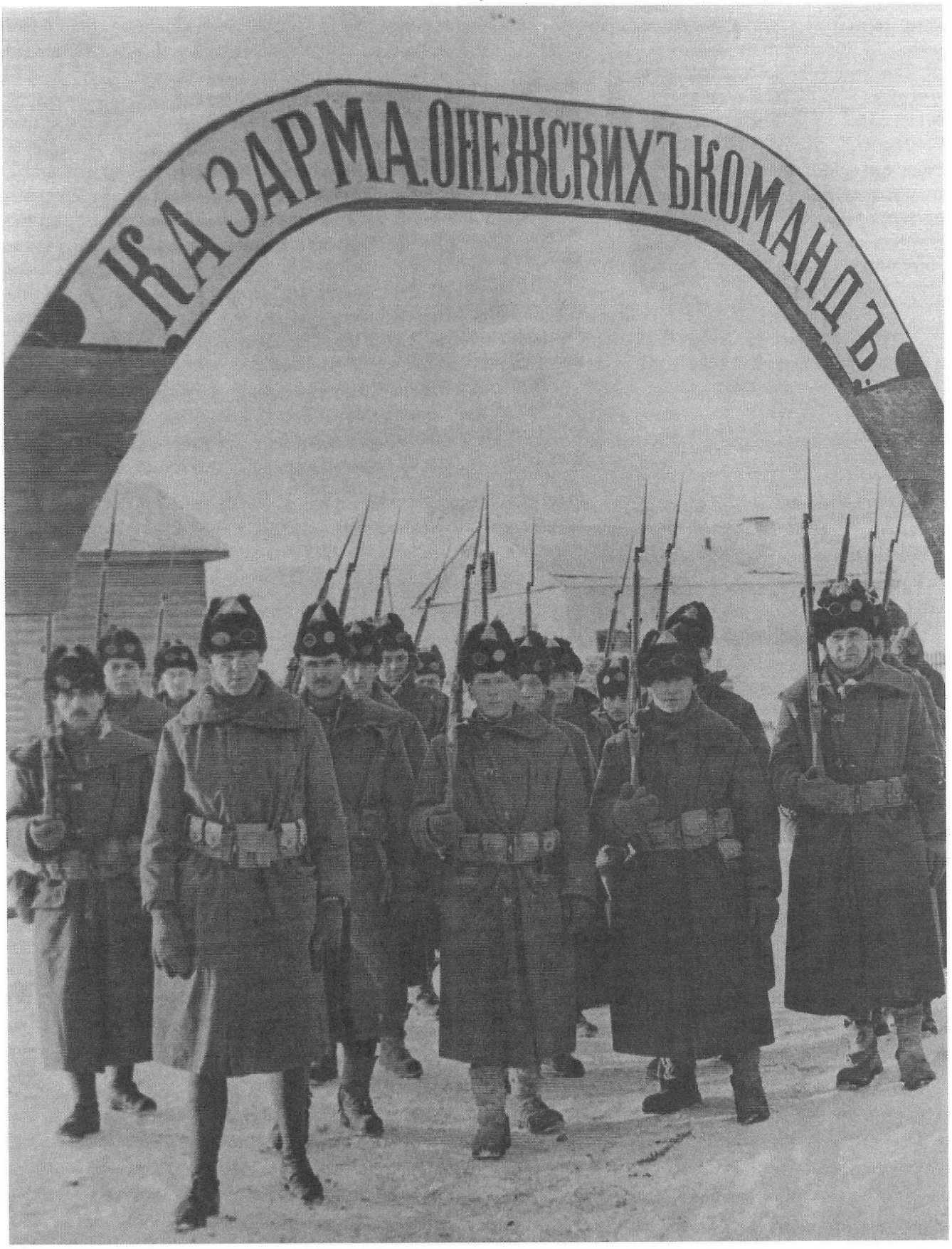
(above) Original 20-round box of 7.62mm Russian cartridges manufactured in March of 1917 by Remington Arms Company. Note the date of the box top. This was the type of ammunition issued with the Mosin-Nagant rifles in United States service.

(below) Close-up view of head stamps on 7.62mm Russian ammunition made by Remington. Note the "17" (1917) date.

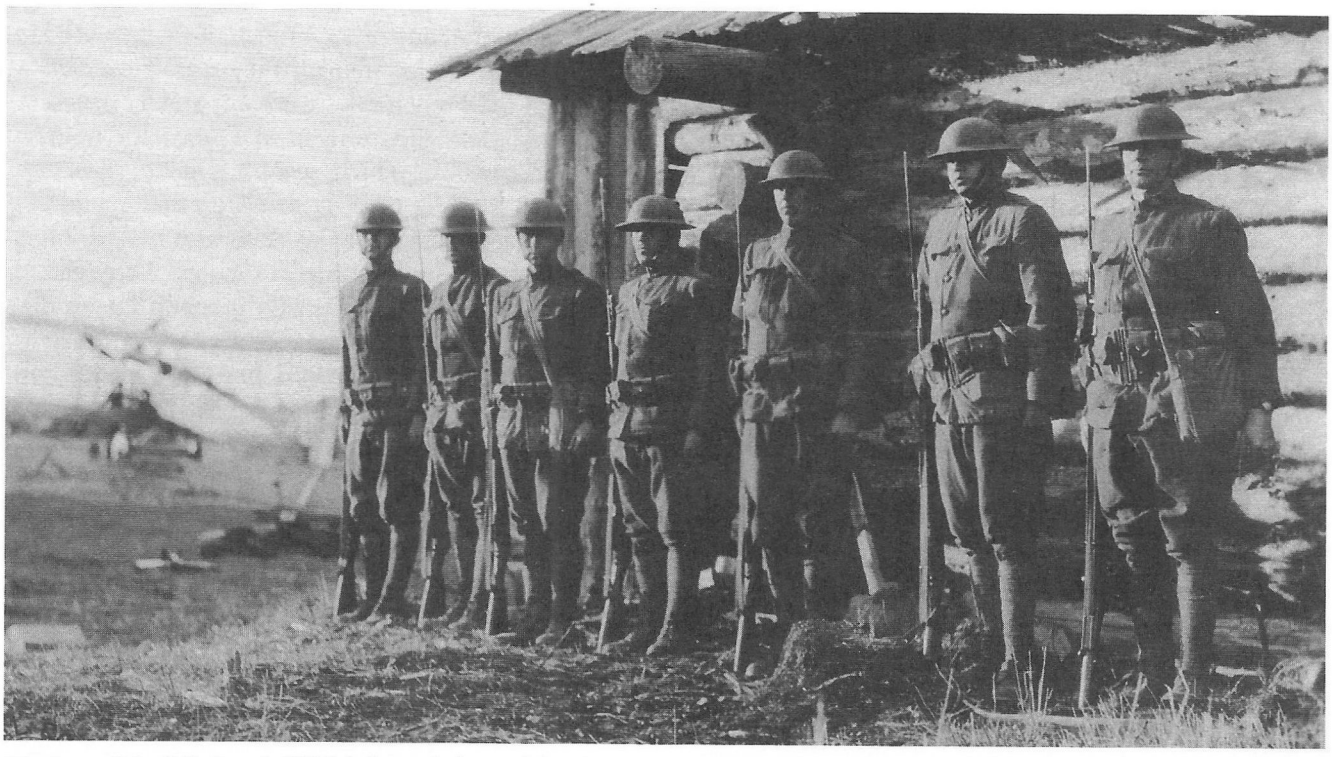




(right) WWI-vintage photo depicting a "Student Army Training Corps" cadet with a M1891 Mosin-Nagant rifle. The SATC was the forerunner of the present-day ROTC. The photo was taken ca.1917–1918 at Augustana College, a private Lutheran College in Rock Island, Illinois, that is still in operation today.
(Rock Island Arsenal Museum)



Platoon of Company G, 339th Infantry, Pinega, North Russia. The troops are armed with M1891 Mosin-Nagant rifles and bayonets.
(Toornman Collection, courtesy of Hayes Otoupalik)



Members of the U.S. Army's 339th Infantry in front of their headquarters at Archangel, Russia, during the North Russian campaign. This photo was taken September 13, 1918. The soldiers are armed with M1891 Mosin-Nagant rifles and are wearing standard U.S. Army uniforms and accouterments. (National Archives)

re-chambered for the .30-06 cartridge by several civilian firms, although this practice is dangerous and is not recommended.

The M1891 Mosin-Nagant is a very interesting weapon that is often omitted when discussing the United States military rifles of the First World War. An example with U.S.-surcharged markings is a wonderful addition to a collection. Some uninformed visitors may ask why a Russian rifle is included in a WWI U.S. military collection. They may be surprised to learn that the weapon is properly classified as a secondary United States service rifle with combat action to its credit.

The French Lebel and Berthier Rifles

Lebel

There were two French service rifles that were in use during WWI. The first was the Lebel, which was adopted in 1886 and was the primary French service rifle of the First World War. The Lebel was noteworthy primarily as it was chambered for the first small caliber (8mm) smokeless powder cartridge adopted for military use. The Lebel was a repeating bolt action design with a tubular magazine located under the barrel. The weapon had a two-piece stock with a straight bolt handle. The Lebel weighed 9.75 pounds and was 51.4" in overall length with a 31.5" barrel. The 8mm cartridge had a 232 grain bullet with a muzzle velocity of 2380 f.p.s. The rear sight was a folding leaf with a "U" notch for short range. The sight was adjustable for elevation only.

The Lebel was manufactured in France by several government arsenals including Chatellerault, St. Etienne and Tulle. There were many modifications and conversions made to the original Lebel design in order to improve its utility. Most were essentially cosmetic in nature. The Lebel was equipped with a spike-type bayonet that is briefly profiled in the bayonet section of this book. It is not believed that any Lebel rifles were issued to American troops.

Berthier

In 1890, the Lebel design was further refined using design changes developed by M. Berthier, a French railway official. The Berthier utilized the basic Lebel action but incorporated a one-piece stock and a Mannlicher-inspired internal box magazine. The locking lugs of the bolt were arranged vertically rather than

the horizontal lugs of the Lebel bolt. The bolt handle was turned down rather than being straight, as was the case with the Lebel. The Berthier was chambered for the same 8mm cartridge used with the Lebel. Since the rimmed French round was originally designed to be used in the Lebel's tubular magazine, it was not well suited to clip loading. To overcome this deficiency, the Berthier was designed to utilize a 3-round "en bloc" Mannlicher-type clip. This loading system was better than the tubular magazine, which had to be loaded with individual rounds. However, the fact that the magazine capacity was limited to three rounds was a definite disadvantage compared to the other military rifles of the day, which typically had 5-round magazines. This is mentioned in a passage from *The Doughboys* which stated, "...they (the French) carried the Lebel rifle, little more than a musket with its three-cartridge clip..."

In 1916, the French modified the Berthier rifles to incorporate a 5-round magazine. However, many of the earlier rifles with 3-round magazines remained in service through the end of the war. The Berthier rifle weighed 8.38 pounds and was 5¼" in overall length with a 31.4" barrel. There were several variations of the Berthier including a carbine. The Berthier rifles issued in French service during the war used the same type of bayonet as the Lebel rifle.

The Model 1907/15 Berthier rifle was produced in France by the St. Etienne Arsenal and the Chatellerault Arsenal. The rifle was also manufactured by Remington Arms Company in the United States under contract for the French government.

The Lebel and Berthier rifles are distinct and separate weapons but both were commonly referred to, incorrectly, as "Lebels" by American troops. This can cause confusion when evaluating reports from the First World War, since "Lebel" was used to denote either type of French service rifle. The Berthier was the only French rifle to be used to any extent by American troops during the war.

Interestingly, authoritative references to the precise number of Lebel and Berthier rifles produced are not available. The Remington Arms Company states that the firm made "...a few thousand..." rifles under French contract. Konrad Schreier, Jr. states the following regarding this topic:

I once asked a French Army ordnance officer I knew how many Lebel and Berthier rifles had been made, and with a very Gallic shrug he said "millions." Further questioning and subsequent research makes me believe that, due to the many models, conversions, modifications, etc. nobody knows and nobody ever will.

Unlike the Mosin-Nagant and Ross rifles, there is no indication that any of the French rifles were used in the United States for training purposes. However, a number of the French rifles were apparently issued to Americans when they arrived in France for training and familiarization. These weapons were likely the M1907/15 Berthier rifles. It is unlikely that any of the M1886 Lebels were issued to American troops. Most of the Berthier rifles issued to our troops were utilized for training with the "V-B" rifle grenade (to be discussed later).

The black American troops who were incorporated into French infantry units during the war were also armed primarily with the M1907/15 Bethier rifles. However, it is very probable that some of the later M1916 five-shot Berthiers were also used by our troops assigned to the French. As stated, it is doubtful if any of the earlier Lebel rifles were used by American troops to any significant extent.

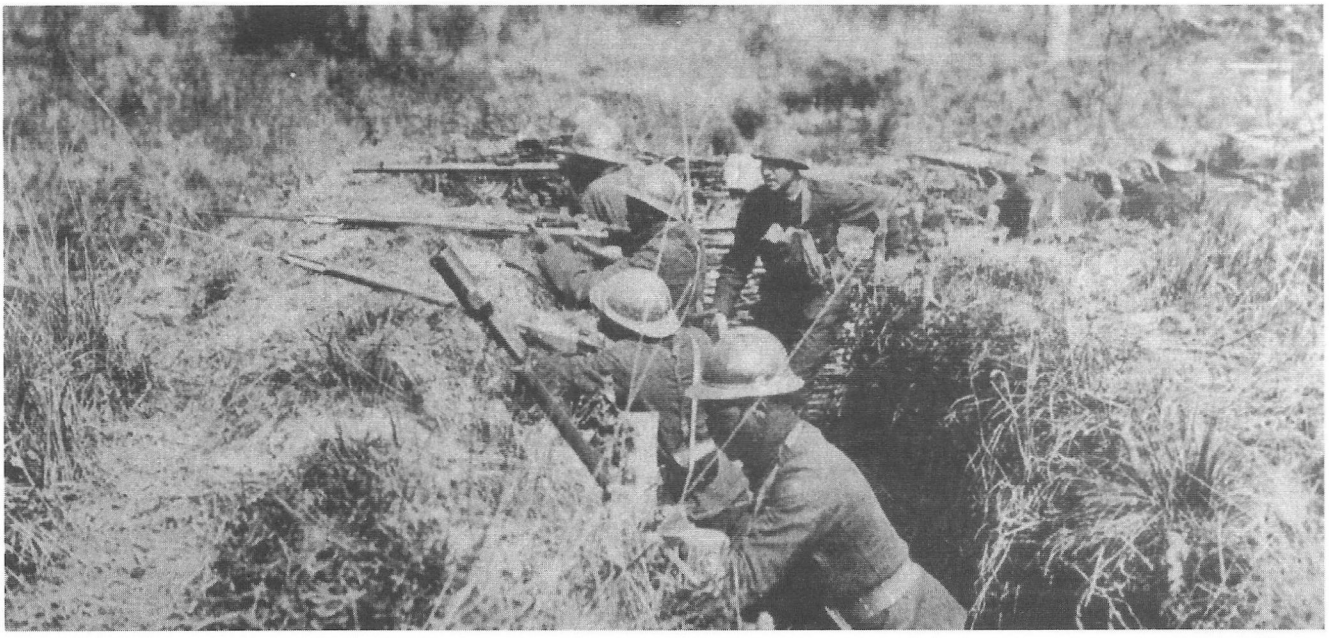
Compared to the magnificent U.S. '03, the French rifles were not very good weapons. As mentioned by Konrad Schreier, Jr.:

Americans who used the Lebel or Berthier rifles in combat either before we entered the war or when with the French Army said their accuracy, compared to the U.S. Army Springfield, was abysmal, awful or worse. They also hated the clumsy handling and length of these French rifles. My own take on the Lebel-Berthier is that they are some of the clumsiest, worst-appearing military rifles ever issued. I have fired a number and never found one with what I call acceptable accuracy even when it had a good barrel and the ammunition was fairly fresh.

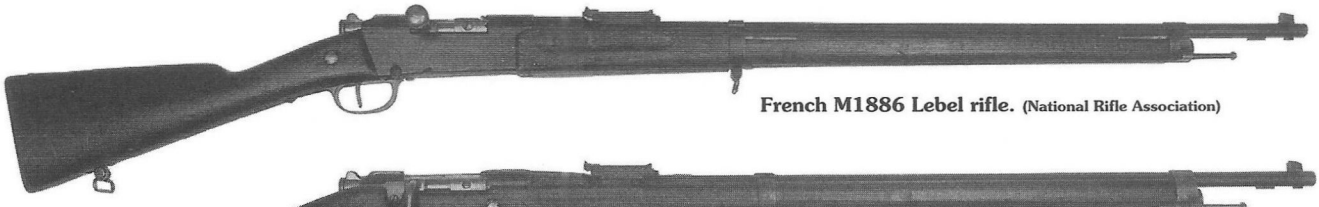
Schreier's assertions are supported by numerous first-hand accounts from our troops during World War I. A passage from *The Doughboys* states that many of American troops assigned to French infantry units "...(missed) many fleeing targets where a Lebel could not achieve a Springfield's accuracy..." The book *Make the Kaiser Dance* contains a comment on the same subject by a Doughboy who trained with the French:

Well, we moved up near the front for some training, now equipped with everything French except our actual uniforms. The biggest disappointment was with their rifles; their Lebels were nowhere near as good as our Springfields... Their rifles seemed more or less something to put a bayonet on.

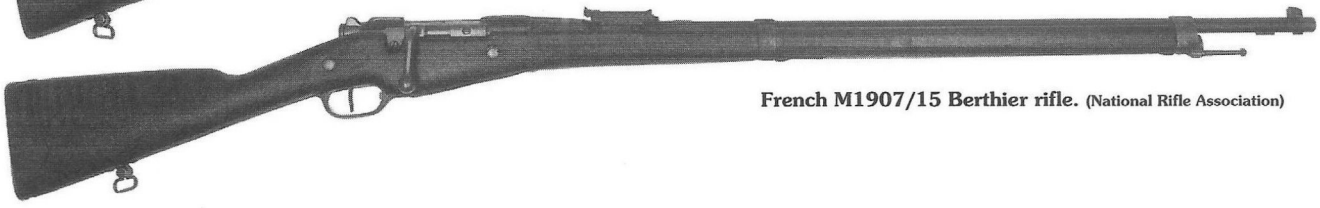
The Berthier rifle remained in French service well into the Second World War. The French rifles were, at best, marginally effective and not on a par with the standard German, British or American service rifles. However, the use of the French rifles by the black American troops of the 369th through the 372nd



Black American troops of the 369th Infantry, 93rd Division, assigned to French command during the Argonne campaign. These soldiers are armed with a variety of French infantry weapons including Chauchat automatic rifles and Berthier rifles. Note the V-B grenade launcher attached to the Berthier rifle in the foreground. (U.S. Army, courtesy Konrad F. Schreier, Jr.)



French M1886 Lebel rifle. (National Rifle Association)



French M1907/15 Berthier rifle. (National Rifle Association)

Black American troops of the 15th Infantry Regiment under French command. The soldiers are wearing French helmets and are armed with M1907 Berthier rifles. (National Archives)

Infantry Regiments that served in the front lines with French Colonial troops should not be forgotten. These brave Americans fought valiantly with less than optimum French rifles.

French RSC Semiautomatic Rifle

As a brief footnote, the French adopted a semiautomatic service rifle in 1917. The weapon was the "Fusil Mitrailleur, RSC, Model 1917." "RSC" were the initials of the designers Rebyrolle, Sautter and Chauchat. The weapon was manufactured at the St. Etienne Arsenal. It was chambered for the standard 8mm French cartridge. A shortened and somewhat improved version was developed in 1918. Very limited numbers of RSC rifles were manufactured, and only a small number saw front-line service. The weapon proved to be inaccurate and unreliable. It was tested by the U.S. Army but was not considered for adoption. It was, nevertheless, a forerunner of later semiautomatic service rifles such as the M1 Garand.

British "SMLE" Rifles

In addition to the French rifles, there were a number of British service rifles used by some American troops in France. These rifles were issued to Doughboys temporarily assigned to British infantry units for training and "familiarization" purposes. As stated in his postwar memoirs, General Hunter Liggett related that "...Divisions that trained with the British used the English Enfield rifle for the time being, because of the difference in ammunition..."

The primary British rifle used by Americans during the war was the "Short Magazine Lee-Enfield Rifle, No. 1, Mark III." The Lee-Enfield was designated as the "SMLE" (**S**hort **M**agazine **L**ee **E**nfield). There were numerous variations of the SMLE rifle. The Mark III was modified in 1916 by the elimination of several components such as the magazine cut-off and changes in the sights. The Mark III weighed 8.62 pounds, with an overall length of 44.5" and a 25.2" barrel. The rifle was chambered for the standard British .303 cartridge having a bullet weight of 174 grains and a muzzle velocity of 2,440 f.p.s.

Prior to WWI, the British felt that the Lee-Enfield was inferior to the Mauser, and plans were formulated to replace the SMLE. The Pattern 1913 rifle (forerunner to the Pattern 1914 mentioned previously) chambered for a ballistically advanced .276 cartridge was slated to replace the SMLE .303 rifle in British service. However, the First World War intervened, and the Lee-Enfield remained the primary British service rifle since production facilities were already in place for the weapon. As subsequent events turned out, the SMLE proved to be a reliable and effective rifle despite the adverse conditions of the Western Front during WWI. The SMLE was capable of functioning in the muddy trenches of France. The design of the SMLE also allowed it to be fired faster than many other contemporary military bolt action rifles. Despite its perceived obsolescence at the time of World War I, the SMLE was modified and remained in British service well into the early 1950s. Not a bad record for a weapon that was thought to be "washed up" in 1914!

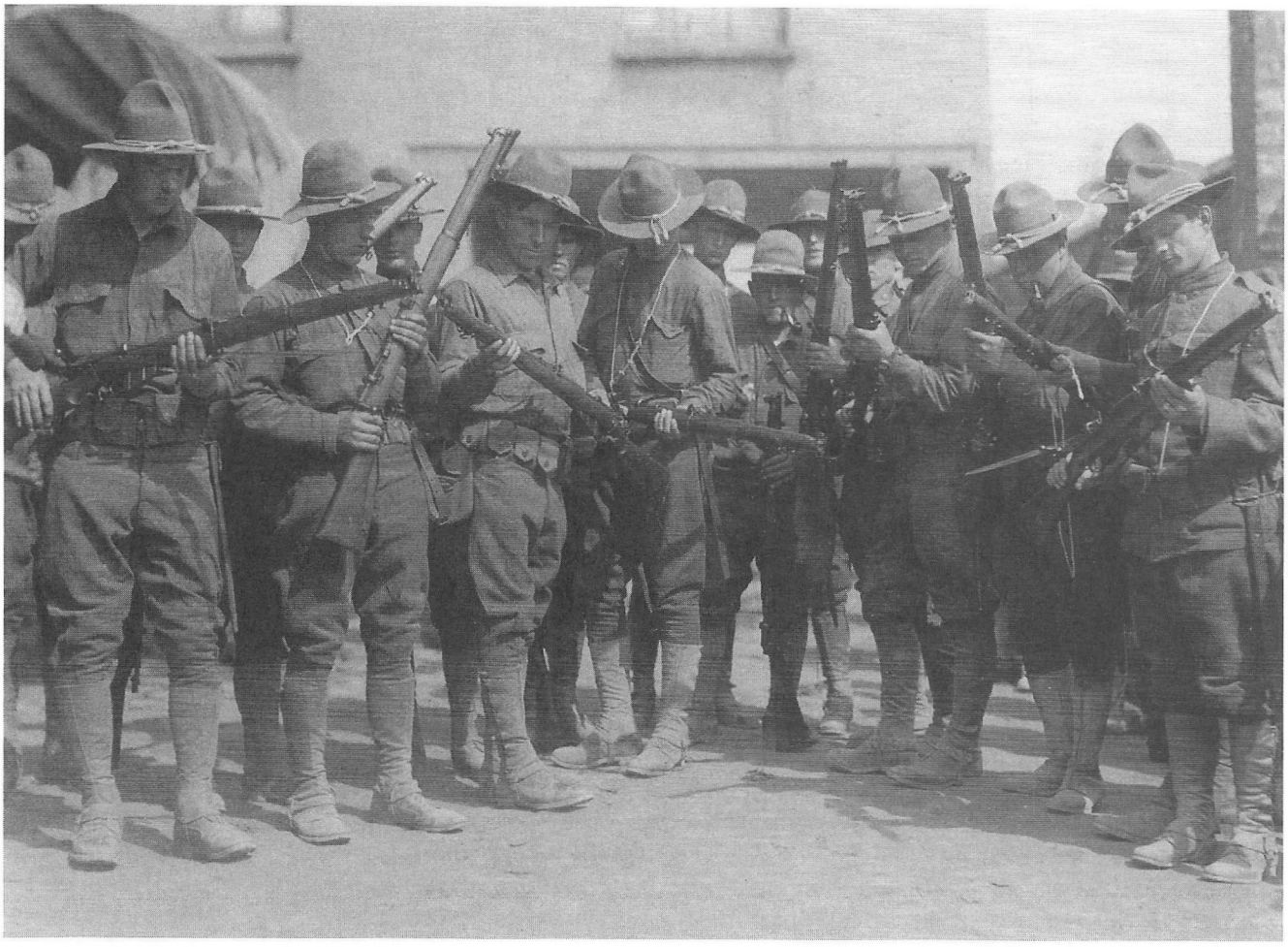
While the majority of SMLE rifles were issued to Doughboys for training purposes, there were a few instances in which Americans used British rifles in actual combat situations. As stated in the book *Over There! The American Soldier in World War I*: "Six American divisions were lent to the British Army in northern France during the final year of the war... To simplify supplying these men, many were armed with British weapons..."

One unit that utilized the SMLE rifle while stationed on the front lines was the 131st Infantry of the U.S. Army's 33rd Division. As stated in a postwar unit report:

Until September 6 (1918), the regiment was stationed in and near Salmagne, refitting itself and preparing for further action. This was a difficult undertaking, in many ways, for the regiment had used the Enfield rifle and the Lewis automatic rifle while on the British front...

Despite the Lee-Enfield's attributes for trench warfare, the Americans who had occasion to be issued the rifle in France universally disliked the weapon. The SMLE was often derided as the "Smelly" by the Doughboys. There were many contemporary reports of the disfavor in which most American troops held the Lee-Enfield. Among these are several reports from the U.S. Army's 4th Division:

British SMLE Rifle, No. 1, Mark III, .303 caliber.
(National Rifle Association)



U.S. Doughboys of Company K, 111th Infantry, 28th Division, inspecting .303 SMLE rifles issued to them in exchange for their M1903 Springfields while on detached duty with the British Army, Pas de Calais, France. Note the U.S.-issue cartridge belts with Enfield bayonet scabbards attached. Photo dated May 19, 1918. (National Archives)

...The weapon which they (American infantrymen) knew and loved, the Springfield rifle, was exchanged for the British Lee-Enfield. This was almost more than the old regulars who formed the nucleus of the Division could stand... The British rifle, which is heavier and clumsier than the Springfield, was issued to all units... Later, when orders were received for the 4th Division to leave the British area and support the French in their resistance to the drive on Paris, the Lee-Enfields were withdrawn and the American rifles re-issued to the troops... (the) great day came when the men of the various units were ordered to march to Samer to exchange their Lee-Enfield rifles. The distance in some cases was eight miles, but a round trip of sixteen miles on a hot afternoon was more than compensated in the minds of the men by the fact that the Springfield rifles were to be returned to them...

The American troops that were issued the British rifles normally retained their standard cartridge belts and other gear. The clipped .303 rounds fit in the pockets of the U.S. cartridge belts, and the British bayonet scabbards could also be attached. The standard SMLE slings and bayonets were used with the rifles. It has been reported that some U.S. troops equipped with the Lee-Enfields were also issued the standard British cup-type rifle grenade launchers that fired a modified Mills hand grenade using a special blank cartridge. However, unlike the French "V-B" rifle grenade launcher (to be discussed later), the British launcher was not standardized by the United States.

The British were very fond of their SMLE rifles and, to this day, often resent any criticism of the weapon. While the Lee-Enfield undoubtedly possessed some positive attributes, the average Doughboy, as we have seen, was only too glad to get back his '03 after being issued the British rifle. The use of SMLE rifles by American infantrymen is another example of foreign weapons being utilized by our troops during the First World War.

Sniper Rifles

Rifles fitted with telescopic sights were used in warfare long before the First World War. Some amazing feats of marksmanship were reported during the Civil War with the surprisingly accurate muzzleloading target rifles of the day. However, these were civilian production weapons and were not officially adopted by the government.

Until the Krag rifle was adopted in 1892, little experimentation was done by the U.S. military regarding telescopic-sighted rifles. In 1900, three M1898 Krag rifles were fitted with telescopes manufactured by the Cataract Tool & Optical Company. A subsequent Ordnance Department report recommended that the Krag/Cataract weapons should be thoroughly field tested. However, development of an improved rifle to replace the Krag resulted in suspension of any extensive field testing or further development work on the proposed "sniper rifle." In the U.S. Army of the day, snipers were often called "sharpshooters."

The static trench warfare that characterized much of the fighting on the Western Front during World War I proved to be tailor-made for sniping on both sides. The fact that the trenches of the opposing sides were often only a few hundred yards (or less) apart meant that snipers could be utilized to harass and intimidate the enemy. Sniping evolved into something of an art during the First World War, and numerous casualties were inflicted upon soldiers who carelessly peered over the trench parapets. Each side was forced to employ snipers as both an offensive and defensive tool. Snipers became feared and hated opponents and any that were unfortunate enough to be captured during a trench raid often met with an ignoble end.

M1903 Sniper Rifles

Soon after the M1903 was adopted and put into production, the Ordnance Department began developmental work on a telescopic-sighted version of the new rifle. The Small Arms Firing Regulations of 1904 authorized the issue of telescopic sights to specially designated marksmen. As stated in Chapter II, Section 235 of the Regulations:

Telescopic Sight — To encourage efforts, to award efficiency, and to properly equip a special class of shots who shall not only be designated as expert, but who, in action, shall be employed as such, the telescopic sight is adopted. These sights will be supplied by the Ordnance Department and assigned to enlisted men who have qualified under these regulations as expert riflemen. They will be issued to and accounted for by the company commander, and, in his discretion, may be carried by the men at inspection under arms.

First World War era U.S. Marine sighting a M1903 Springfield rifle fitted with a Winchester A5 telescope. This combination was the standard USMC sniping weapon of WWI. (U.S. Marine Corps)

Warner & Swasey Musket Sights Model of 1908

Although the Small Arms Firing Regulations of 1904 and 1906 stated that "the telescopic sight is adopted," none were on hand. The Ordnance Department evaluated several rifle telescope designs and eventually settled on a rather unusual scope developed by the Warner & Swasey Company of Cleveland, Ohio. Warner & Swasey was a well-known entity to the Ordnance Department and had previously supplied artillery fire-control equipment and optical instruments to the government. Twenty-five of the Warner & Swasey telescopes were purchased in 1906 and fitted to M1903 rifles for testing. The experimental W&S telescope was a prismatic design that allowed for a wide field of view for the relatively high power (6X) of the scope. The scope was attached to the M1903 rifle by means of a dovetail base fastened to the left side of the receiver. A spring-loaded plunger held the scope to the base and allowed it to be removed easily from the rifle. This location permitted loading and firing the weapon in the normal manner and allowed the standard iron sights to be used with the scope in place. However, this offset location required that the shooter assume a somewhat awkward firing position. No alterations of the standard M1903 rifle were necessary, except for attachment of the receiver base and the removal of a small portion of wood on the left side of the stock to provide the necessary clearance.

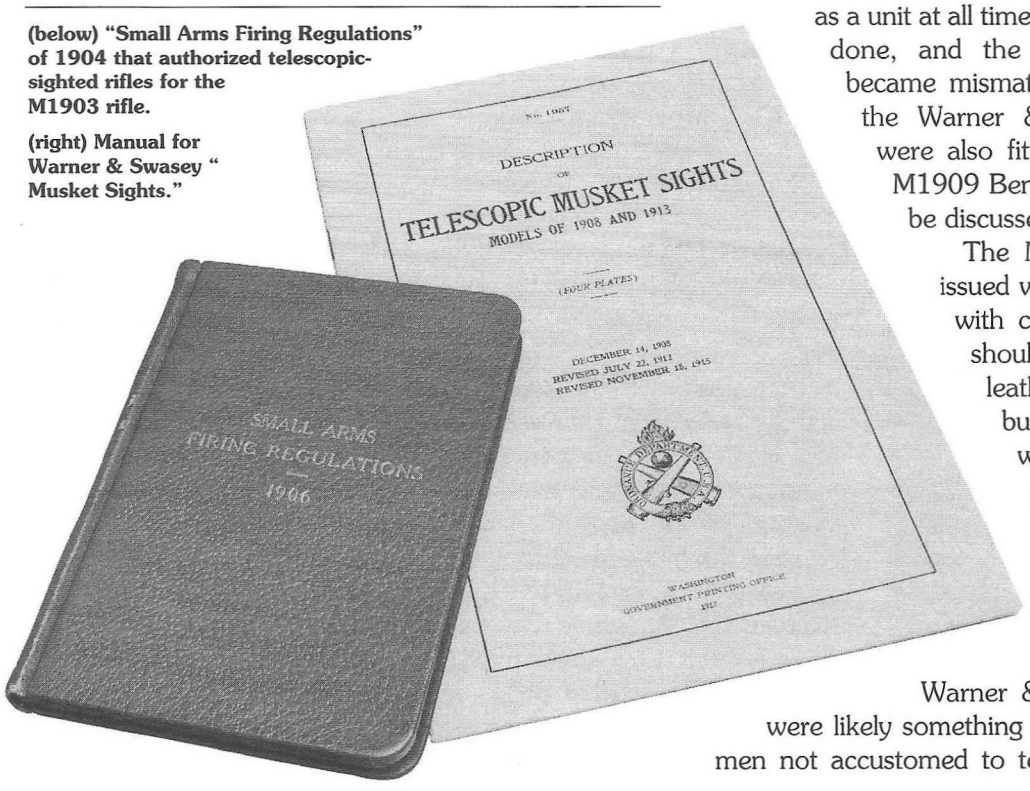
The experimental Warner & Swasey scope was tested by the Ordnance Department and found to be satisfactory for service use. However, the very high price of the scope, about $80.00 per unit, was nearly double the cost of an '03 rifle and was deemed excessive. This dissatisfaction with the price of the scope resulted in the company modifying the design a bit, and the price was reduced to a satisfactory level.

In 1908, the modified Warner & Swasey scope was officially adopted as the "Telescopic Musket Sight, Model of 1908." The M1908 W&S scope was made of black painted steel and brass, and weighed a substantial 2¼ pounds. Warner & Swasey markings and a sight serial number were stamped on the left side. Two brass plates containing firing and sight adjustment data were attached to the top of the sight. The sight had a cross hair reticle and three stadia lines for estimating distance. The short eye relief of the sight required a rubber eyepiece to properly position and protect the shooter's eye.

One thousand M1908 W&S sights were procured in 1909, ten were purchased in 1910 and the final acquisition of one thousand and sixty-five M1908 sights occurred in 1912. The W&S sights were fitted to specially selected M1903 rifles at Springfield Armory. The serial number of the rifle to which a sight was mated was stamped inside of the sight's dovetail recess. Rifle serial numbers were generally in the 340,000 to 500,000 range. Regulations called for matched rifles and scopes to be kept together as a unit at all times. However, this was rarely done, and the rifles and scopes soon became mismatched in service. Some of the Warner & Swasey M1908 sights were also fitted to the newly adopted M1909 Benét-Mercie machine rifle (to be discussed later in this book).

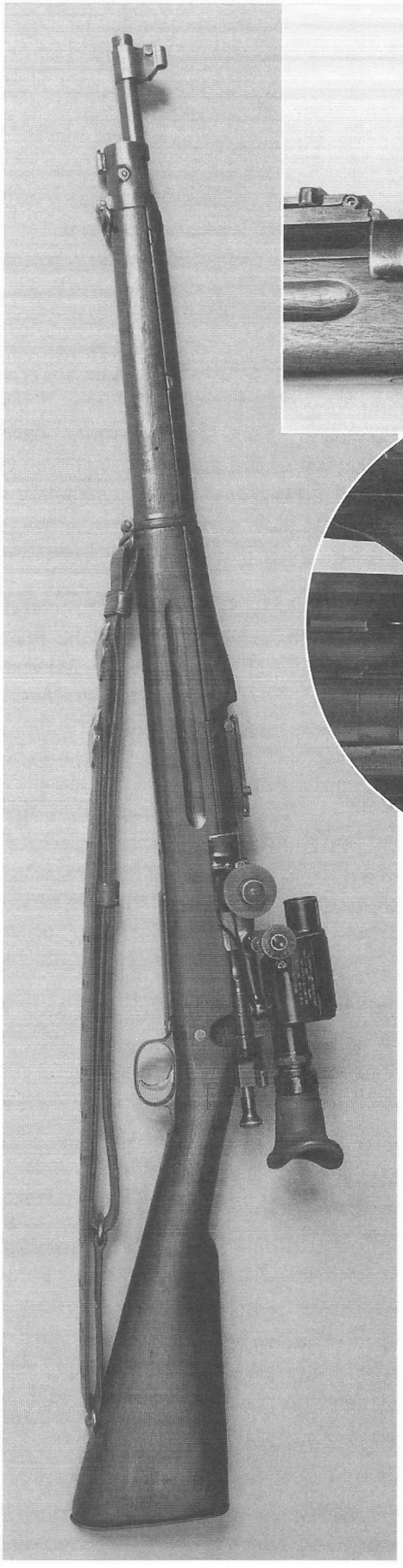
The M1908 W&S sights were issued with a leather carrying case with cartridge belt hooks and a shoulder strap. The case had a leather cover flap secured by a buckle. A metal adjustment wrench was carried in a pocket located inside the cover flap. These cases were manufactured by Rock Island Arsenal.

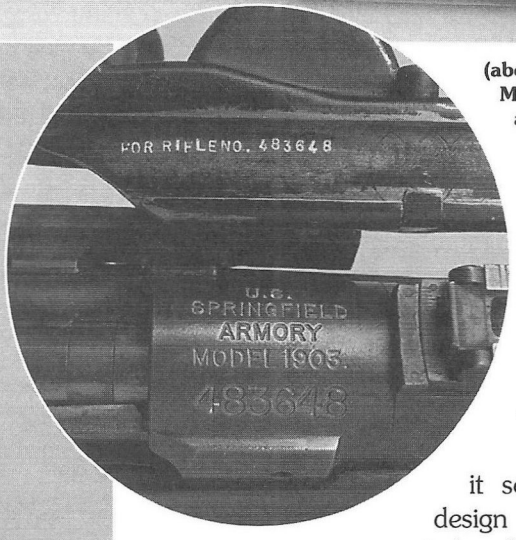
The M1903 rifles fitted with the new Warner & Swasey "musket sights" were likely something of a novelty to the marksmen not accustomed to telescopic sights. However,



(below) "Small Arms Firing Regulations" of 1904 that authorized telescopic-sighted rifles for the M1903 rifle.

(right) Manual for Warner & Swasey " Musket Sights."





(above) Close-up view of M1908 Warner & Swasey Musket Sight. Note the windage and elevation adjustment knobs and the rubber eyepiece on the sight.

(left) M1903 rifle receiver with serial number and matching serial number stamped inside of Warner & Swasey sight recess. Matching units are very rare.

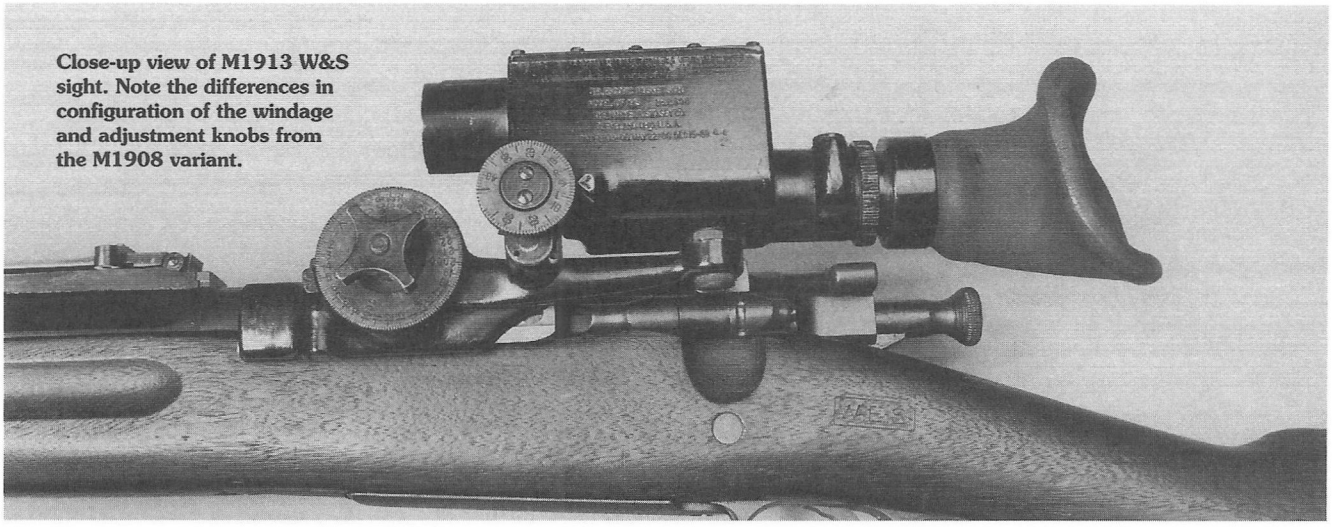
(far left) M1903 Springfield rifle fitted with M1908 Warner & Swasey "Musket Sight." Even though superseded by the time of WWI by the M1913 W&S sight, some M1908 sights were undoubtedly fielded as well.

it soon became obvious that the W&S design was not a very good telescope and myriad problems were encountered. The prismatic design meant that any specks of dirt or flecks of paint that found their way inside the scope were magnified six times in the sight picture. Also the short eye relief, rubber eyepiece and awkward shooting posture were not conducive to good marksmanship. As E.C. Crossman put it in his classic *Book of the Springfield*, the Warner & Swasey sight could "...make a flincher out of a cigar store Indian."

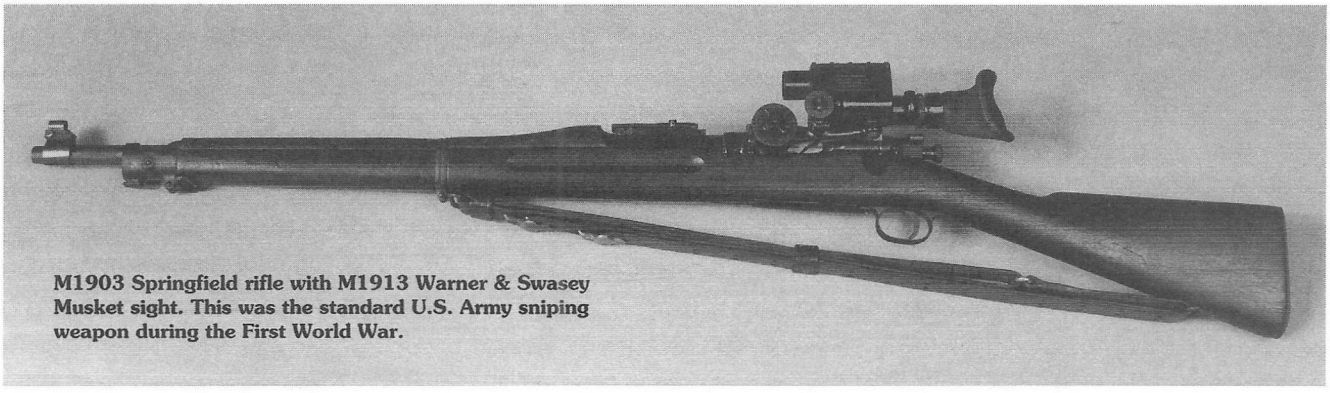
Model of 1913

The complaints lodged against the M1908 W&S sight resulted in a redesigned variant that was adopted as the "Telescopic Musket Sight, Model of 1913." The main difference between the M1913 and its predecessor was the lowering of the power to 5.2X to improve the light-gathering characteristics. The outside configuration of the body was slightly changed as was elevation dial and locking nut. The method of attachment to the rifle and virtually everything else was identical to the M1908 model, and the new variant did little to improve the problems encountered with the original design.

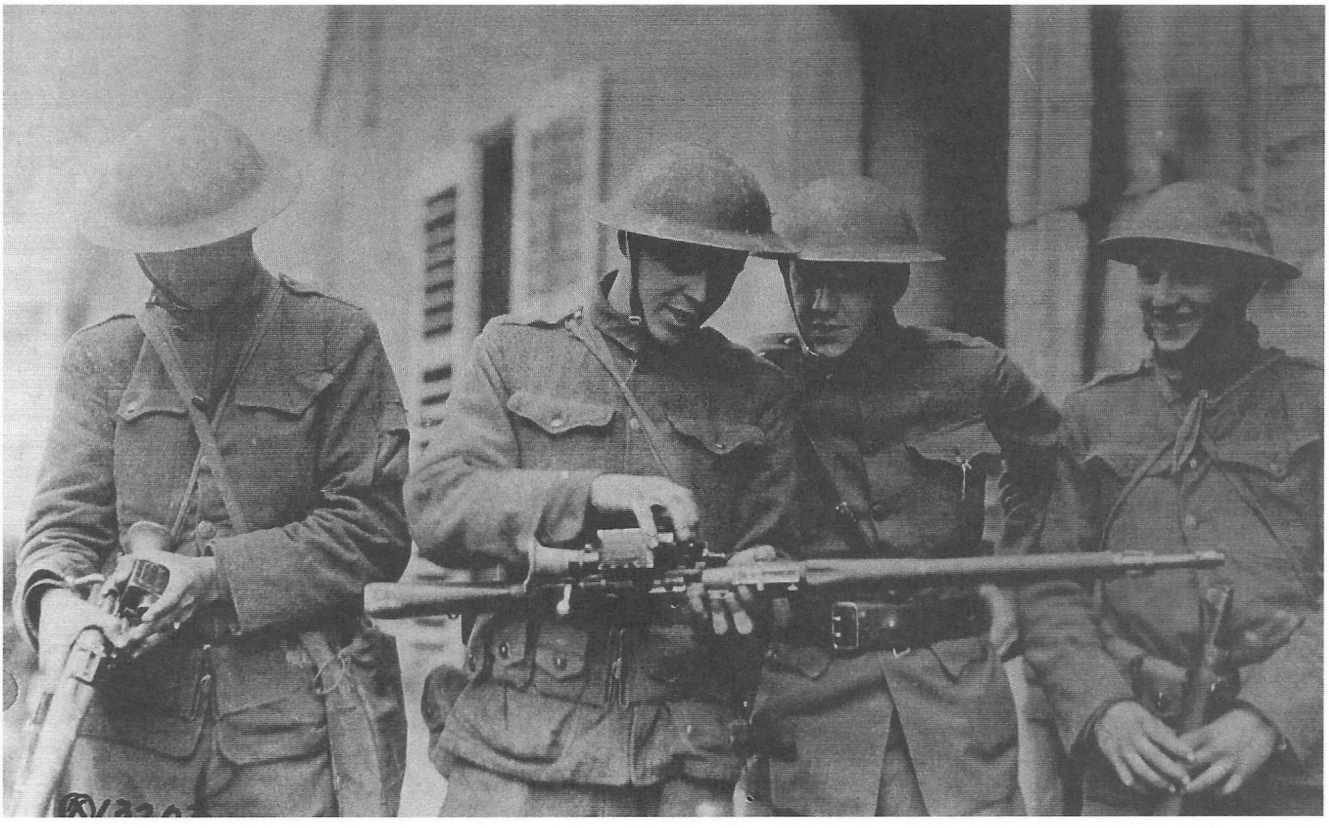
In any event, the M1913 superseded the M1908 variant and was the standard U.S. Army rifle telescope at the time of the First World War. Some M1913 W&S scopes were fitted to select M1903 rifles during the late 1916 to early 1917 period, although most were assembled in Fiscal Year 1918. Ordnance records indicate that 1,041 M1913 W&S sights were installed on M1903 rifles in FY1918. The only facility to



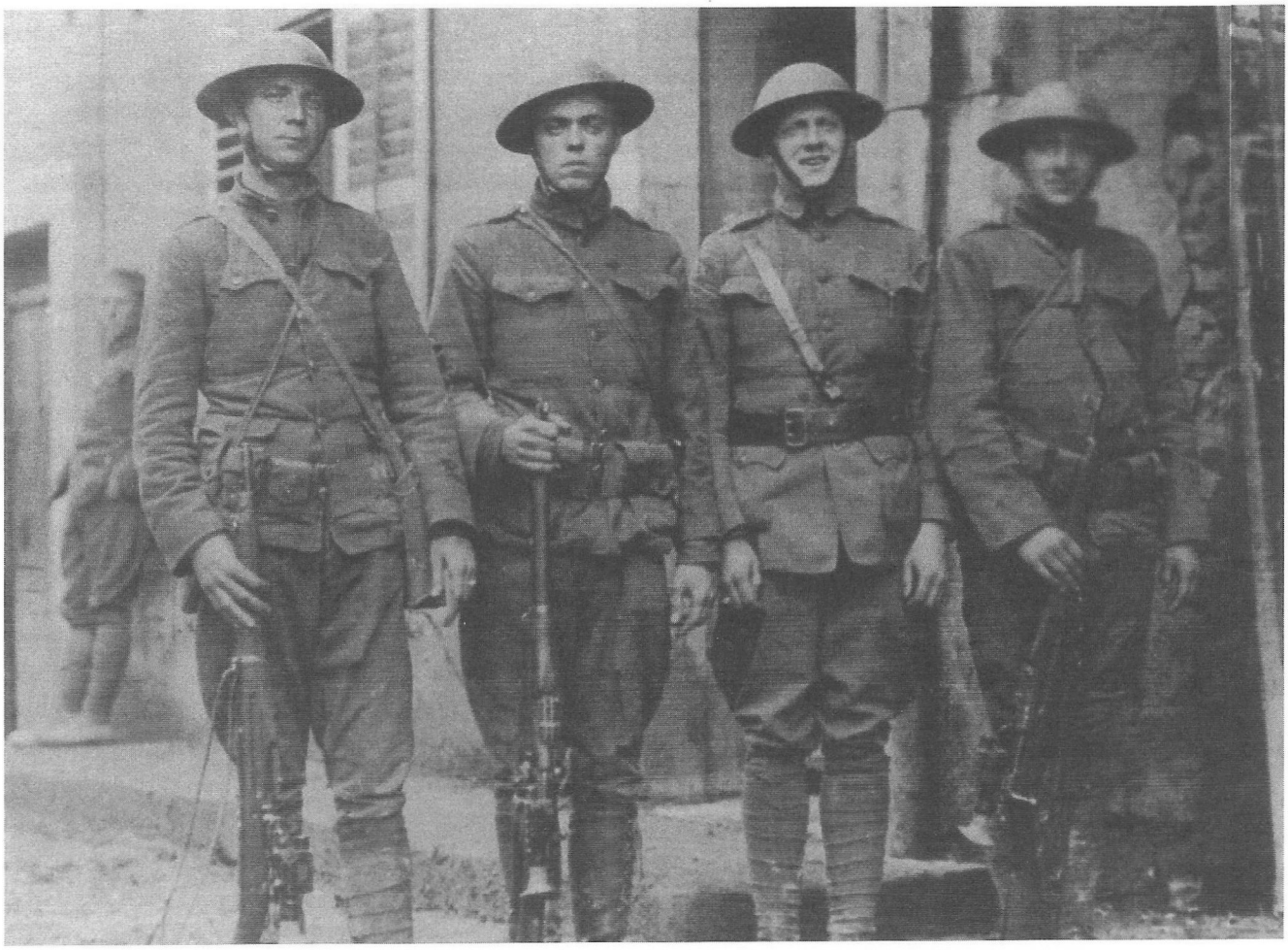
Close-up view of M1913 W&S sight. Note the differences in configuration of the windage and adjustment knobs from the M1908 variant.



M1903 Springfield rifle with M1913 Warner & Swasey Musket sight. This was the standard U.S. Army sniping weapon during the First World War.



U.S. Army snipers examining their M1903 rifles with M1913 W&S sight prior to deploying to front-line positions. (National Archives)



U.S. Army snipers with M1903/W&S rifles. (U.S. Army Military History Institute)

(above, left) U.S. Army sniper firing his M1903 Springfield rifle with M1913 Warner & Swasey sight from a trench position in WWI. Note the cut-down rubber eyepiece which was a common field modification.

(above, right) Doughboys in the entrance of a trench dugout. Note the M1903/W&S sniper rifle (with cut-down eyepiece) being held by the soldier at left. (U.S. Army Military History Institute)

Carrying case of M1913 W&S sight. Note the adjustment wrench in the outside pocket.

Carrying case for M1908 W&S sight.

Doughboy displaying a "pattern painted" M1903 rifle equipped with a W&S M1913 sight. (U.S. Army Military History Institute)

install W&S sights on M1903 rifles was Springfield Armory, and none were assembled at Rock Island Arsenal. Some Maxim silencers had been fitted to W&S-sighted rifles during the Mexican campaign in 1916, but very few of the silencers are believed to have been used during WWI for combat purposes due to their fragility and adverse effect on accuracy.

The Canadians purchased a number of M1913 W&S sights for use with sniping variants of their Ross rifles. These arms saw service in France prior to America's active involvement in the war.

When the Doughboys began to deploy overseas, a number of M1903 rifles fitted with Warner & Swasey sights accompanied them. Most were the later M1913 model, although some of the earlier M1908 sights were undoubtedly employed as well. The M1903 rifle/W&S rigs apparently saw a fair amount of combat use by U.S. Army snipers during the war. The official World War I allowance for M1903 rifles fitted with W&S sights was 96 per division.

Anecdotal evidence indicates that the sights were marginally effective despite their many deficiencies. The rubber eyepieces were often removed or cut-down to suit the preferences of the users. Some of the scopes were modified after they left the factory by adding two screws to the mount that could be tightened to provide more secure attachment to the base.

Ordnance Department records indicate that 4,000 M1913 sights were procured from Warner & Swasey by the time of the Armistice. However, the majority of these sights were not installed on '03 rifles and were sold as surplus some years after the war. The M1913 sights that were actually fitted to '03 rifles and issued can be identified by the rifle serial number stamped inside of the mount dovetail recess. Rifle serial numbers were generally in the 570,000 to 950,000 range. According to Frank Mallory, about twenty serial numbers of these rifles were found in the Archives. Most were issued to the 31st Infantry, but a few were sold to individual officers. Rifle serial numbers fall in the 577XXX to 935XXX range, and the telescopic sight serial numbers fall in the 22XX to 69XX range. Although not spelled out in the records, these were undoubtedly Warner & Swaysey Model of 1913 sights based on the sight serial numbers. The last shipments noted for these rifles/scopes was December of 1919. Examples found today that are not marked with serial numbers inside the dovetail recess were surplus and were not fitted to rifles. Obviously, such scopes were not items of issue during the war. It should be noted that the W&S serial numbers stamped on the left side of the sights had no correlation to the rifle serial number inside the dovetail mount.

A leather carrying case similar to the type issued with the M1908 sight was manufactured for the M1913 sight. The case also had a leather shoulder strap, and a pocket was sewn to the outside to hold an adjustment wrench. Some of these cases issued with M1913 W&S sights were made by Rock Island Arsenal, but most were produced by a commercial firm and marked "Diamond D". The case was also fitted with hooks that allowed it to be carried on the cartridge belt.

A few of the M1903/W&S sniper rifles were "pattern painted" to aid in camouflaging the rifles while in trench positions. Some standard '03s were also painted in the same manner.

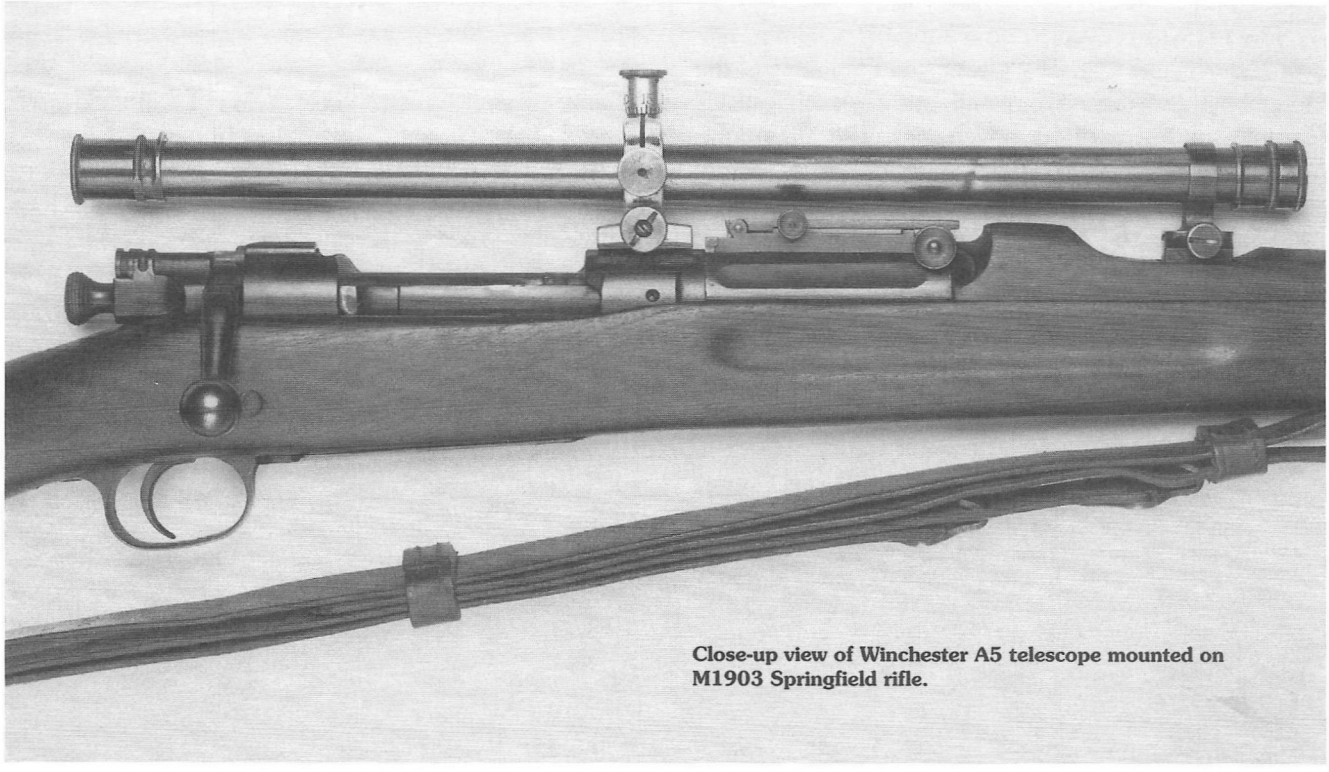
Some have theorized that the twenty-five round extension magazines (mentioned previously) were used with some '03 rifles fitted with Warner & Swasey scopes. There is absolutely no evidence to indicate that this was done, and any such use is very doubtful.

The M1903/W&S sniper rifles remained in use through the end of the war, and most were withdrawn from service several years later. In spite of being a less than optimum design, the M1903 rifles fitted with Warner & Swasey telescopic sights were the only U.S. sniper rifles fielded in significant quantities during the war.

M1903 Rifles with Winchester A5 Telescopes

Although used in much larger numbers than any other type, the Warner & Swasey musket sights were not the only rifle telescopes employed by the United States during WWI. A much smaller quantity of standard M1903 rifles fitted with Winchester A5 telescopes also saw some use in the war. The A5 scope was introduced by Winchester in 1910 and it achieved some measure of popularity in the civilian market. The U.S. Marine Corps acquired a number of these telescopes for use on some of the '03s used by their rifle team. The A5 scopes were mounted on standard M1903 rifles by Marine armorers at various facilities. The front scope mount was attached to the barrel which required that a hole be routed in the handguard to provide the necessary clearance. The rear mount was screwed to the receiver ring. There will be some variance found in the spacing of the scope mounts and other details of these USMC rifles as they were modified on essentially an individual basis. Initially, commercial scope mounts were used by the Marines to attach the A5 scopes to their rifle team '03s. Around the time that the U.S. became actively involved in WWI, some specially made "Mann"-type tapered scope mounts were used by the Marine Corps to mount the scopes. The Marine Corps A5 scopes were generally issued with a leather carrying case with a shoulder strap. The A5 scope was later slightly redesigned and designated as the "5A."

M1903 Springfield rifle fitted with Winchester A5 telescope. This combination was the standard U.S. Marine Corps sniping weapon at the time of the First World War.



Close-up view of Winchester A5 telescope mounted on M1903 Springfield rifle.

A number of the rifle team '03s fitted with A5 scopes accompanied the Marine contingent when it deployed to France. Little has been written regarding the performance of these weapons, but they were undoubtedly put to good use in the hands of the skilled Marine marksmen. However, the number on hand was quite small, and virtually all Marines were armed with standard '03s without scopes. Some of the M1903/A5 sniper rifles stayed in the Marine Corps inventory well into the Second World War.

In addition to the A5 scopes obtained by the Marine Corps, Ordnance Department records indicate that 400 were purchased by the U.S. Army prior to the Armistice. The use of these scopes by the Army during the WWI period is not widely known. However, Konrad Schreier, Jr. indicates that "...some M1903 'target grade' rifles with A5 scopes (reportedly) got to France with the AEF National Guard Divisions, but it is unknown if any got as far as combat." If this was the case, these rifles likely used the same type of commercial scope mounts as found on the pre-1917 USMC rifles (i.e., not the special tapered "Mann" bases). Any use of the A5 scope in France by the U.S. Army was undoubtedly quite limited.

Although better than the Warner & Swasey sight for general use, the Winchester A5 was too fragile to be an effective military sniper telescope. While greatly overshadowed by the standardized Warner & Swasey musket sights, the '03 rifles fitted with A5

telescopes should not be forgotten when considering the U.S. sniping rifles of the First World War.

The M1903 sniping variants are extremely interesting and historically significant weapons. The inherent accuracy of the M1903 rifle was enhanced by the addition of a telescopic sight. It is unfortunate that better designs were not utilized, but the Warner & Swasey and Winchester A5 sights were better than no scopes at all for sniping use. While they were greatly outnumbered by the standard '03 service rifle, the telescopic-sighted versions provided valuable service to the Army and Marine snipers. They often made the trenches on the other side of "No Man's Land" a dangerous place to be.

The M1903 proved to be a superbly accurate, reliable and versatile rifle. The weapon in the hands of the Doughboys favorably impressed our allies and struck fear into the hearts of our adversaries. The '03's rightful place in the annals of United States military is secure.

"Model of 1918" Sniper Rifle

The deficiencies of the Warner & Swasey and Winchester A5 scopes spurred the development of an improved military rifle telescope. Several designs were evaluated including the German Goerz scope. However, this superior telescope was not approved for adoption. Instead, the "Telescopic Rifle Sight, Model of 1918" was adopted as a replacement for the scopes currently in service. Winchester was given a contract to produce 32,000 of the telescopes. The Eastman Kodak Co. of Rochester, New York, was to produce 42,607 sets of optics for the M1918 telescope (and for replacement purposes). The M1918 telescope was a substantially modified Winchester A5 with a shorter tube. The scope was 2.6X power and was initially viewed as an improvement over both the Warner & Swasey sights and the Winchester A5.

Although the prototype M1918 scope was tested with the M1903 rifle, it was intended to be teamed with a new sniper weapon based on a modified M1917 rifle. The proposed new sniper rifle was to be standardized as the "Model of 1918" sniper's rifle. The weapon was essentially a M1917 Enfield with special scope mounts, no front sight and a shortened stock. No handguards were fitted. The government ordered the rather sizable number of 59,742 M1918 sniper rifles from Winchester, although only 189 had been manufactured by the time the contract was canceled on January 10, 1919. None of the weapons were fielded in combat before the war ended.

Subsequent tests at Camp Benning and Camp Meade revealed that the M1918 telescope was an

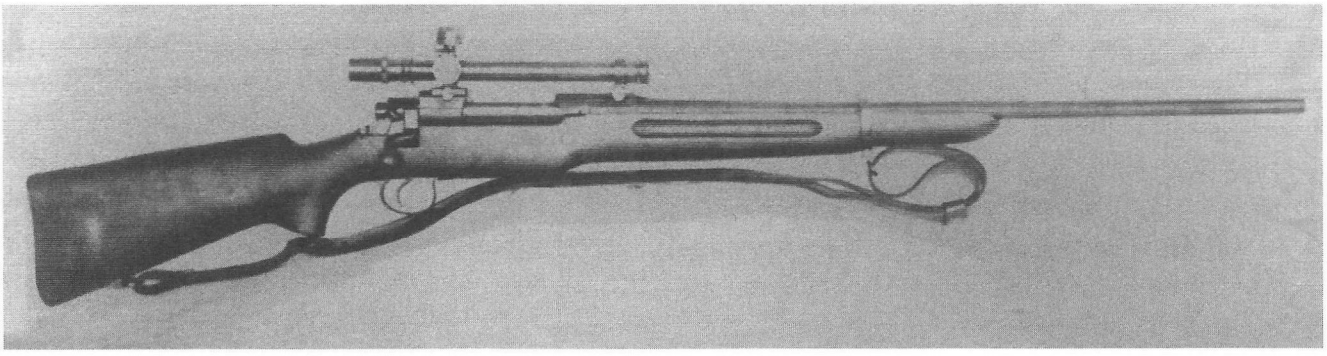
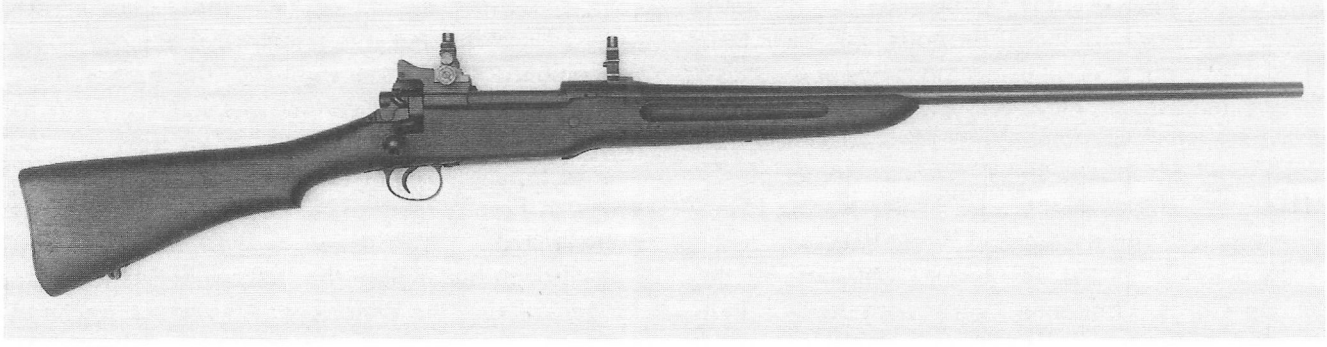


Illustration from WWI-vintage Ordnance Department publication depicting a M1918 rifle with M1918 telescope.



"M1918" Sniper rifle. This prototype weapon was developed by Winchester Repeating Arms Company from the M1917 service rifle. Note the modified stock, barrel and scope mounts. This example is missing the M1918 telescope. Serial number of the rifle is 102630. Note the difference in the configuration of the stock compared to the M1918 rifle above. (Buffalo Bill Historical Center, Winchester Arms Collection)

unsatisfactory design and that it "shot apart" after only moderate use. It is likely that the design could have been modified and strengthened, but no further action was taken when the contracts were canceled. Details regarding the test results for the M1918 sniper rifle have not been discovered but, based on the M1917 rifle's performance, the weapon was likely capable of acceptable accuracy. It is interesting that the superbly accurate M1903 rifle was not selected as the platform upon which to build the proposed new sniping arm.

The following description of the M1918 sniper rifle and telescopic sight is quoted from the U.S. Army *Handbook of Ordnance Data* published in 1919:

United States telescopic sight rifle, model 1918 — *This rifle, which is derived from the United States rifle, model 1917, is adopted for the telescopic musket sight, model of 1918. It is intended primarily for sniping and most of its parts are interchangeable with the parts of the 1917 rifle. The exceptions are as follows:*

Receiver — *There is no rear sight base and no rear sight. A dovetail base for the rear telescope mount takes the place of these.*

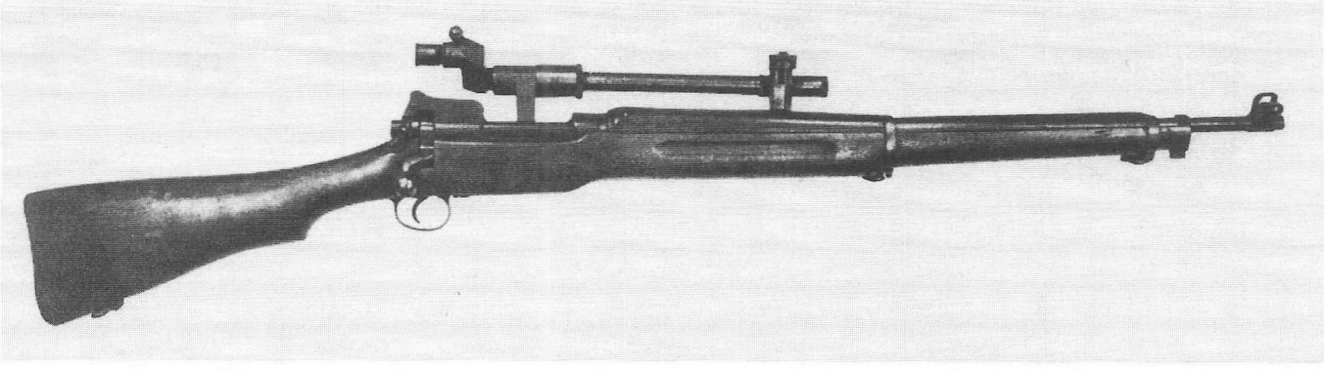
Barrel — *There is no front sight, the barrel being adapted to receive screws for the front telescopic parts. The rifling is right-hand twist with one turn in 10 inches and the standard tolerances and type of land of the Springfield rifle are employed. The stock is of special construction with no handguard, nor upper band, while the lower band is of special design.*

Telescopic musket sight, model of 1918 — *The telescopic musket sight, model of 1918, for use with the United States telescopic sight rifle, model of 1918, was formerly called the Winchester 2.6-2.7 telescopic sight, having been developed by the Winchester Repeating Arms Co. It was adopted as the United States Army standard in lieu of the Model of 1913. It is mounted over the receiver and consists of a direct or nonreflecting telescope 2.7 power, with independent front and rear mounts. On the rear mount there is a windage and range adjustment. At 100 yards the field is 44'1". Aiming point is a post at the optical center of the telescope. A cross hair serves to level the instrument. This telescope possesses unusual optical and mechanical properties, and was adopted as standard after long competitive tests at Camp Meade. It is made by the Winchester Repeating Arms Co. As stated, it is used on the telescopic sight rifle, model of 1918, which is derived from the United States rifle, model of 1917.*

There are no known examples of the prototype M1918 sniper rifle or M1918 telescope extant outside of two or three examples in museums or reference collections. There was little or no further development work carried out on the M1918 sniper rifle following the First World War. If the war had lasted into 1919 (as expected) and the problems with the M1918 telescope could have been overcome, the M1918 would likely have been the standard U.S. military sniper rifle during the postwar years. As it turned out, the weapon is now but a little-known footnote of ordnance history.

M1917 Sniper Rifle with Experimental Prismatic Telescope

In addition to the M1918 sniper rifle, some experimentation was done to develop a sniping weapon based on the M1917 rifle fitted with an unusual offset mounted prismatic telescope. This weapon was jointly developed by Victor M. Czejka and Major K.K.V. Casey. Only a couple of prototypes of this weapon were fabricated and tested by the army. The M1918 sniper rifle was deemed a more serviceable design, and further development of the prismatic telescope concept was eventually dropped.



M1917 rifle fitted with experimental offset-mounted prismatic telescope. This weapon was briefly tested but was not recommended for adoption. (*American Rifleman* magazine)

"Trench Periscope Rifles"

The trenches of World War I were often a place where raising one's head above the parapet might well be one's last act on earth. The United States military was well aware of the horrific casualties inherent in trench warfare and looked for ways to reduce the threat. Many ideas were suggested, and several were eventually carried to the prototype stage and field tested. There were many periscopes issued that allowed for observation above the trenches without exposing the observer to enemy fire. While such items enabled observation to be done, it was not possible to return fire while viewing the enemy through a periscope. Other devices were considered such as metal shields, helmets with protective visors and various types of body armor. None of these devices proved to be practical. The most promising of these ideas was a device that allowed a rifle to be fired above a trench parapet while the rifleman was concealed below it. Several nations experimented with this concept, but it never progressed beyond the prototype stage.

When the United States entered the war, two rifle enthusiasts from Cleveland, Ohio, James L. Cameron and Lawrence E. Yaggi, developed an experimental concept that consisted of a rifle fitted into a metal framework that rested on the shoulder and held the weapon above the shooter's head. The bolt and trigger could be manipulated by extension levers. The rifle was sighted by means of a periscope attached to the weapon.

Cameron and Yaggi began the preliminary developmental work on their idea prior to America's entry into the war. A working model was fabricated and taken by Yaggi on an informal demonstration tour of the French battlefields. Although the French and English had experimented with roughly similar ideas, the "Cameron-Yaggi" rifle was well received by our allies. Yaggi heard many French and British soldiers complain that the Germans often observed the glint from the trench periscopes in use and held their fire until the allied soldiers raised their heads to shoot. Such a device as the Cameron-Yaggi rifle could eliminate this hazard.

When Yaggi returned from France, he and Cameron began work on a refined version of their invention using suggestions received from our combat-wise allies. Since the United States had entered the war by this time, Cameron and Yaggi recognized that their weapon must be based on the standard M1903 rifle if it was to have any chance of being embraced by the Ordnance Department. Our military was inundated

Right-side view of Cameron-Yaggi Trench Periscope rifle.

Interesting assortment of Allied trench periscopes of the First World War. While all of these devices allow a soldier to peer over the top of a trench parapet, only the Cameron-Yaggi and similar weapons permitted firing back at the same time. (Robert G. Segel collection)

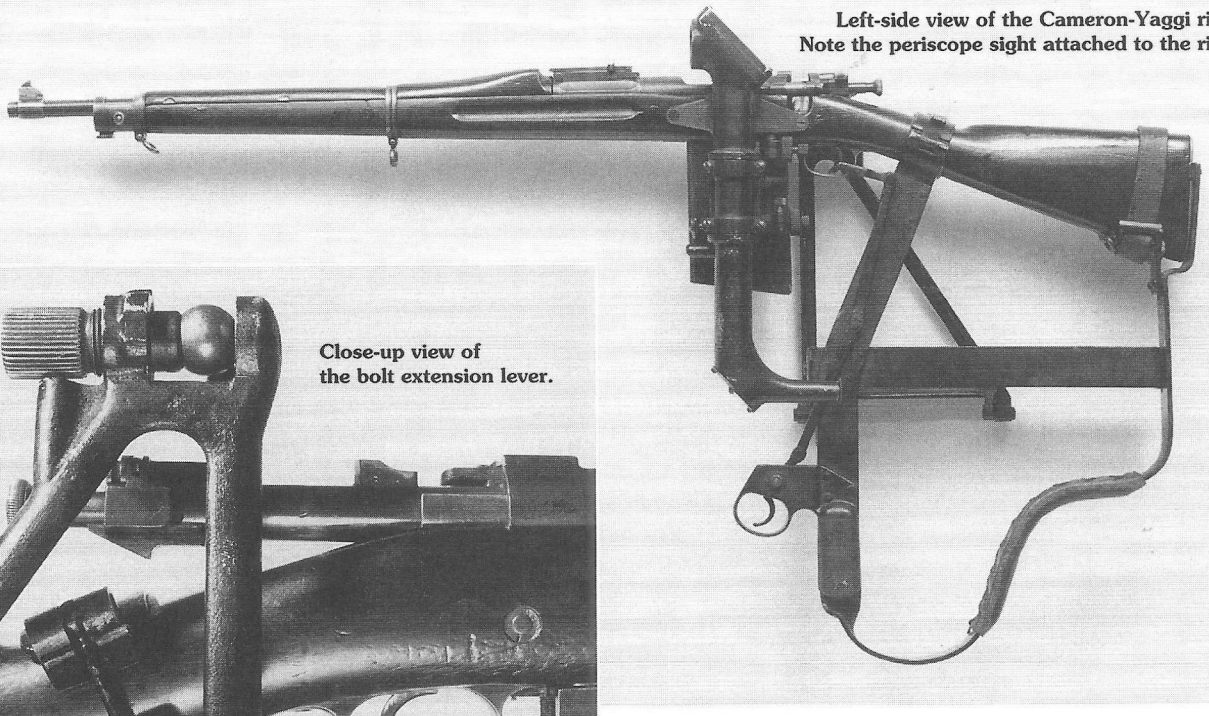
with ideas for weaponry ranging from the practical to the crackpot. When Cameron and Yaggi made preliminary overtures to the Ordnance Department, it was made clear to the two inventors that the government would not be interested in any sort of special trench warfare rifle that required substantial or permanent alteration to the standard M1903. Some concepts, such as the Guilderson rifle, were intriguing ideas but required significant alteration of the standard M1903 rifle. The Guilderson rifle featured a hinged stock that could be extended to fire over a trench in somewhat the same manner as the Cameron-Yaggi or folded to function basically like a standard service rifle. The Cameron-Yaggi design, on the other hand, utilized an unmodified M1903 rifle placed in the metal framework. The only alteration was the removal of the stock screws to permit attachment of the dovetail periscope mount. The mount could be easily removed and the standard stock screws reinstalled with little effort.

With the parameters suggested by the Ordnance Department defined, the two inventors began work to refine their apparatus. The Cameron-Yaggi prototype consisted of a metal framework that supported a standard M1903 rifle. The rifle was held in place by a leather strap that secured the butt to a metal cup at the rear of the framework and a metal clamp that gripped the small of the stock. A thin leather pad was laced to the portion of the framework that rested on the shoulder. The shooter's hand was placed on a wooden grip that contained the remote trigger. This was attached to the rifle's trigger by means of a hinged extension lever. A remote bolt handle was located adjacent to the wooden hand grip and was attached to the rifle's bolt by another extension lever. The extension lever slid back and forth along a metal rod and could be raised and lowered to manipulate the rifle's bolt knob. The rifle's bolt handle was held in a concave metal socket that could be adjusted to the proper tension.

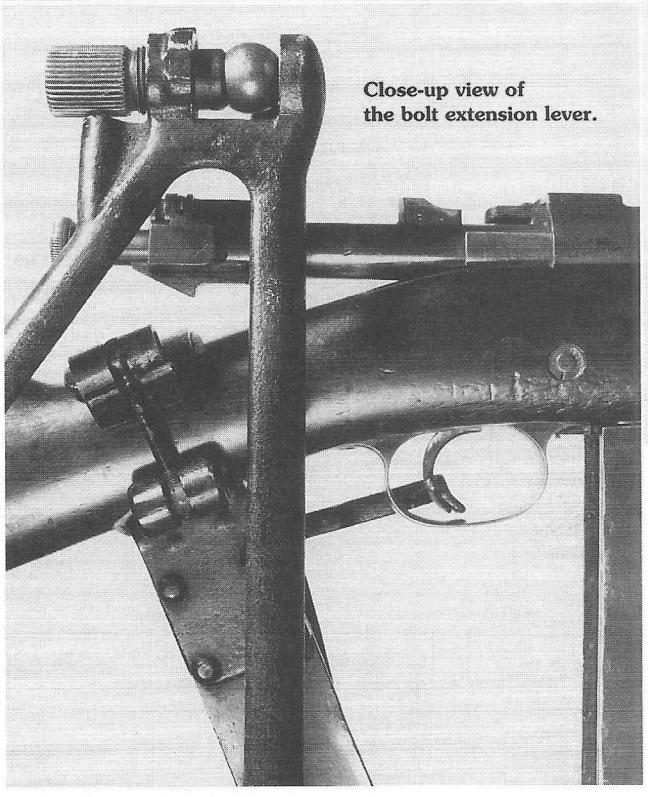
Once the apparatus was in place, the rifle could only be reloaded by removing it from the shoulder. In order to increase the weapon's sustained fire capability, a twenty-five round extension magazine (discussed previously) was fitted.

The Cameron-Yaggi rifle was sighted by means of

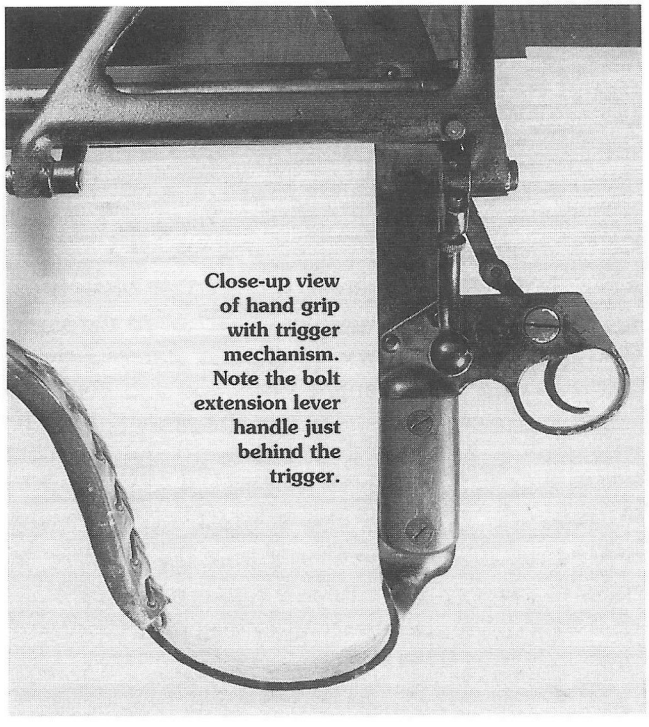
Text continued on page 114.



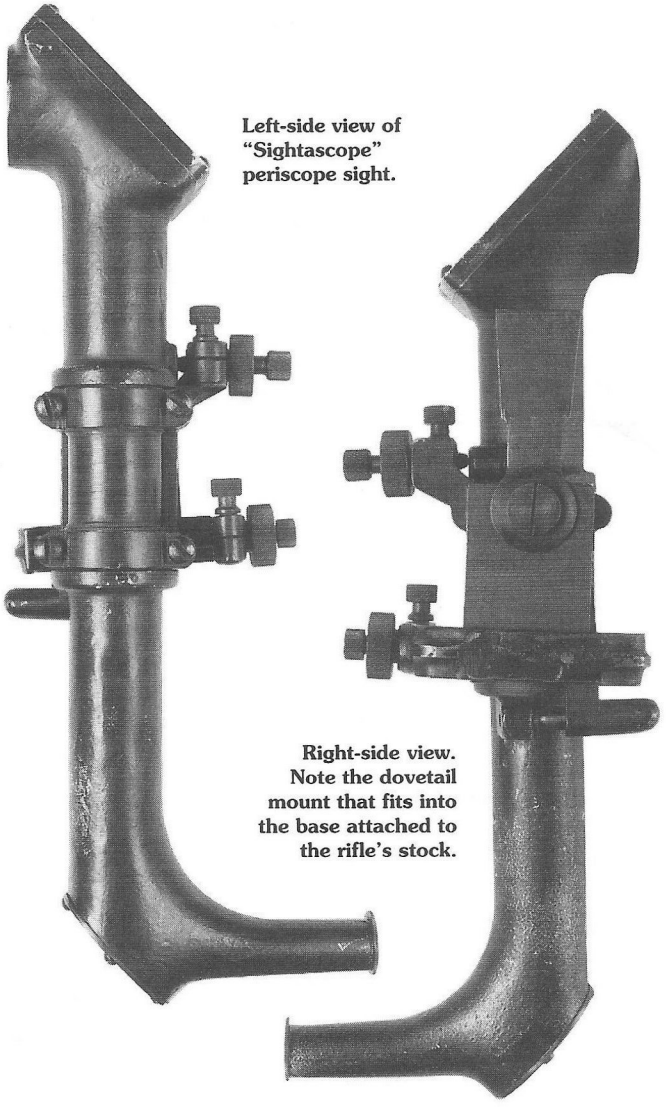
Left-side view of the Cameron-Yaggi rifle. Note the periscope sight attached to the rifle.



Close-up view of the bolt extension lever.



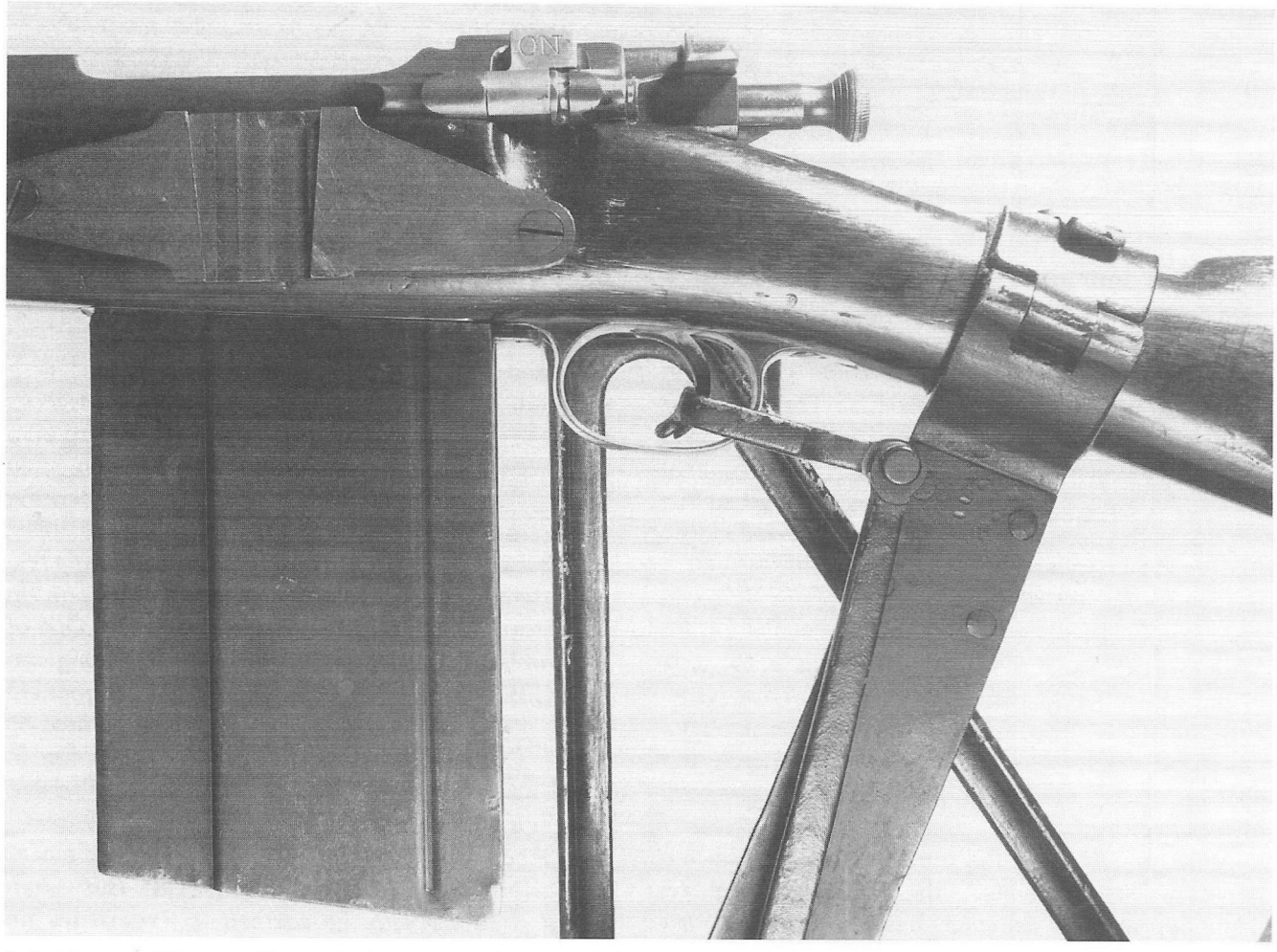
Close-up view of hand grip with trigger mechanism. Note the bolt extension lever handle just behind the trigger.



Left-side view of "Sightascope" periscope sight.

Right-side view. Note the dovetail mount that fits into the base attached to the rifle's stock.

M1917 variant of the Guilderson rifle. (National Rifle Association)



Left-side view of Cameron-Yaggi rifle depicting the dovetail sight base, the 25-round extension magazine and the hinged lever attached to the trigger.

Photo from 1917 *Arms and the Man* magazine showing the Cameron-Yaggi rifle being fired over the top of a trench parapet. The gentleman firing the rifle is not identified and could be one of the inventors. ***(Arms and the Man/American Rifleman)***

Text continued from page 111.

an optical instrument that the inventors called a "sightascope." The periscope sight allowed the rifle to be fired with surprising accuracy. During one of the numerous tests of the weapon, ten shots were fired at 200 yards with a spread of only 1.3". The periscope sight had no internal adjustments, and the windage and elevation were changed by means of two external knobs. As stated, the periscope was attached to the left side of the rifle by means of a metal dovetail mount that could be removed without causing any permanent change to the '03 rifle. There was apparently some experimentation done with the magnification of the "sightascopes" as a 1X sight as well as a 4X type have been reported. All known variants have cross-hair reticules. The lens of the Cameron-Yaggi periscope sights was recessed so as reduce the chances of glint or reflection, a suggestion previously offered by our allies.

When mounted on the metal framework with the periscope sight attached, the Cameron-Yaggi rig might appear to be extremely heavy and unwieldy but the apparatus actually added only about six pounds to the weight of the '03 rifle. The weapon was obviously more cumbersome than a standard rifle. However, it was not intended to be carried over great distances but, rather, remain in a static trench environment. The Cameron-Yaggi could be slung over the shoulder if required. Holding the weapon on the shoulder could be somewhat ungainly, but with the barrel resting on a trench parapet or similar support, the weapon could be fired for extended periods without experiencing excessive fatigue or discomfort.

After suitable refinements, the Cameron-Yaggi rifle was demonstrated by Mr. Yaggi at a range in Winthrop, Maryland, in the summer of 1917. One of the spectators present at the demonstration firing was Col. C.B. Winder, a noted marksmanship proponent of the day. After observing the weapon being fired by Yaggi, Col. Winder requested permission to fire it. Winder's experiences with the weapon were related later in a 1917 *Arms and the Man* article:

...About the first thing the peculiar framework suggested to the Colonel was KICK! But when Yaggi fired the rifle he seemed to experience no inconvenience. Afterwards, describing the effect of the heavy service charge on the weapon held in the

Photo from the same article showing the portability of the Cameron-Yaggi rifle. *(Arms and the Man/American Rifleman)*

light framework (Winder) said: "There was a lot less kick to it than the rifle ordinarily gives. The whole framework, rifle and all, just seemed to rock back a little."

The added weight of the framework undoubtedly helped dampen the recoil somewhat. Even though the periscope sight's eyepiece was very close to the shooter's eye, unlike typical rifle telescopes the effect of recoil rocked it away from the eye.

Cameron and Yaggi made a few additional refinements and formally submitted their invention to the Ordnance Department for consideration in late 1917. There were apparently only a very small number of prototype Cameron-Yaggi rifles fabricated. It is interesting to note that no two of the weapons are exactly alike and all known specimens vary slightly in some respects. These variances included minor differences in the configuration of the shoulder supports, the design and precise placement of the trigger assemblies and extension levers.

The exact number of Cameron-Yaggi rifles made is not known but likely numbered a dozen or so. The Springfield Armory Museum reportedly has one in inventory, and there are perhaps three or four in private hands in varying degrees of completeness.

There are no known Ordnance Department records formally rejecting the Cameron-Yaggi rifle, and the weapon was apparently still being considered for procurement at the time of the Armistice. This would certainly seem to suggest that the government felt the weapon had some merit. On the other hand, since it was not immediately adopted and put into production soon after its initial testing, this would likely mean that the military had some qualms about the weapon as well.

Cameron and Yaggi contemplated a similar contrivance for the M1917 rifle and Lewis light machine gun, but neither variant is believed to have been manufactured. The previously mentioned Guilderson rifle, which featured a collapsible hinged stock and a smaller and less effective periscope sight, was not adopted either. It appears that the Guilderson rifle received less official interest than the Cameron-Yaggi due, no doubt, to the fact that it required extensive modification of the standard rifle and was less effective in actual use. A rifle very similar to the Cameron-Yaggi, but with a somewhat different pattern periscope sight, is illustrated in the U.S. Army *Handbook of Ordnance Data* and identified as the "Elder Periscope Attachment." The reason for this identification rather than the Cameron-Yaggi name is not known.

The conclusion of WWI spelled the end to any further consideration of the Cameron-Yaggi rifle. Trench

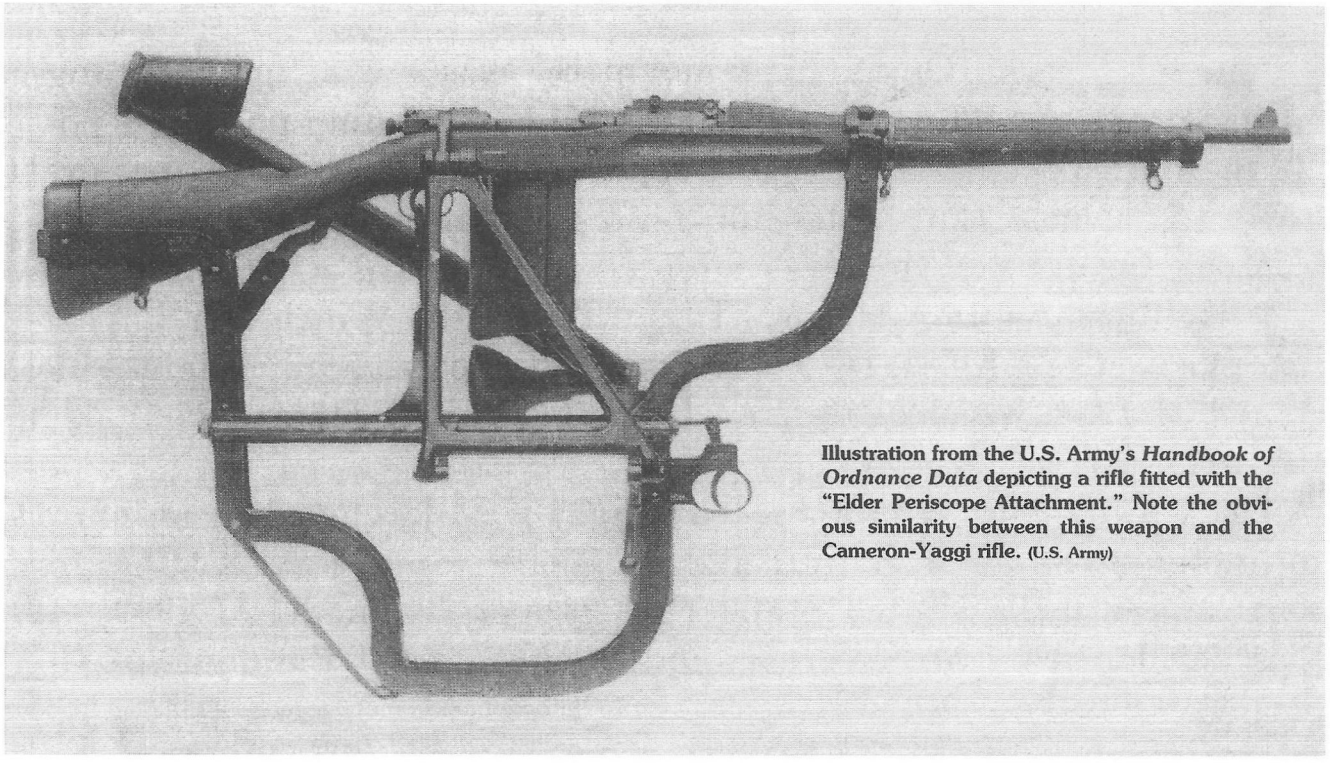


Illustration from the U.S. Army's *Handbook of Ordnance Data* depicting a rifle fitted with the "Elder Periscope Attachment." Note the obvious similarity between this weapon and the Cameron-Yaggi rifle. (U.S. Army)

warfare understandably fell out of favor and there was no real or perceived need for such a weapon. Nevertheless, to a Doughboy in the trenches of France in 1917–1918, being able to fire at the Germans without raising his head (and perhaps losing it in the process) would likely have seemed an excellent idea. It is unfortunate that the Cameron-Yaggi rifle did not have an opportunity to prove itself in battle. Today, the weapon is a little-known, but thoroughly interesting, footnote to American military history.

Miscellaneous Rifles

There are two other rifles that saw limited use by the United States military during the First World War. Neither type was made or issued in large numbers for infantry use, but both are interesting and little-known U.S. weapons of World War I.

Winchester M1894 Carbine

One of the most famous and popular civilian sporting rifles of all time is the Winchester M1894. Introduced in 1894, the lever-action arm was produced for almost a century, and large numbers are in use for deer hunting and other purposes today. Many variants of the 1894, including rifles and carbines, were produced for the civilian market. The gun was made in several calibers including the .32 Special but, by far, the most common and popular cartridge was the venerable ".30-30."

During World War I, the U.S. government acquired a quantity of standard commercial production Winchester M1894 carbines chambered for the .30-30 cartridge. The guns were marked on the top of the receiver ring with a hand-stamped Ordnance Department "flaming bomb" insignia and a "US". The serial numbers for the U.S.-surcharged M1894 carbines fell into the 835800 to 852500 range. Other than the martial markings, the carbines had standard features and markings typically found on commercial production M1894 carbines of the period.

The existence of the martially marked M1894 carbines has been known for many years, but little information regarding specific details of these weapons has previously been published. Government documentation is sketchy, but some archival data is known. The weapons were procured by the Ordnance Department for Signal Corps use by means of Contract #291 granted on December 2, 1917. The contract called for the purchase of: "...1,800 Model 1894 Carbines sighted for centerfire smokeless powder cartridges cal. .30 with full patch bullets." Fifty thousand .30-30 cartridges were also purchased by the government for use with these weapons. This contract is the only one known to have been given by the government for the procurement of Winchester M1894 carbines.

Typical receiver tang markings on WWI-vintage Winchester M1894 carbine.

"US" and ordnance "flaming bomb" markings added to M1894 carbines purchased by the government during WWI. The added markings are very similar to the markings stamped on WWI-vintage Winchester M1897 "trench" shotguns.

(left) Very rare photo (poor quality) of WWI U.S. Army Signal Corp soldier armed with a Winchester lever action carbine. The soldier is wearing a set of experimental wireless earphones under his campaign hat. (Tim Staats)

Many people have speculated as to the purpose of these M1894 carbines and their intended use. Actually, the primary purpose of these carbines was to arm Signal Corps personnel stationed in the Pacific Northwest region of the United States. This area was the major producer of the giant spruce trees that were needed at the time for aircraft production. Spruce was the favored wood to use for building airplane wings and fuselages, and the material was considered critical to the war effort. The region experienced some labor turmoil and, Signal Corps personnel were assigned to the timber-harvesting areas to prevent any interference with delivery of the spruce lumber. The Signal Corps was originally the branch of the Army that was charged with aviation-related procurement. The acquisition of the M1894 carbines from Winchester was undoubtedly done to keep standard service rifles such as the M1903 or M1917 from being diverted from front-line combat service or training use. In addition to the M1894 carbines procured directly from Winchester under Ordnance Department contract, it appears that a few older M1892 lever-action rifles or carbines were also acquired by the Signal Corps during this period as well. These were probably acquired in very small numbers from local sources and were not procured directly under government contract as were the M1894 carbines. No specific documentation regarding such weapons is available, and any use of M1892 arms was likely extremely limited. Specific details such as markings and serial number ranges are unknown, and the M1894 carbines procured from Winchester are the only authenticated lever action arms used by the United States military during the World War I period.

It is possible that other troops were issued the M1894 carbines, such as border guards and state guard units, although this is unconfirmed. George

Winchester M1894 .30-30 carbines. One thousand eight hundred of the commercially manufactured arms were purchased by the U.S. government in late 1917 for issue to Signal Corps units posted to the Northwest section of the United States. The guns were intended primarily to arm troops stationed to protect the spruce forests of the region that were considered vital to the war effort.

Madis stated in *The Winchester Book* that some of the M1894 carbines were issued to members of the AEF for overseas duty. He further indicated that a photograph exists depicting such a weapon in the hands of a Doughboy in France. However, this photograph has not surfaced, and any use of the M1894 carbine in anything remotely resembling overseas combat duty is extremely doubtful.

Even though it was not an infantry weapon in the strictest sense, the martially marked M1894 carbines are nevertheless historically significant and quite interesting arms of the First World War period. Such weapons are a great example of a civilian gun being "drafted" into military service.

Winchester Model 1907 Self-Loading Rifle (SLR)

Another civilian arm that was procured in limited numbers by the U.S. Army during the First World War was the M1907 Self-Loading Rifle. The SLR was one of the earliest and most effective semiautomatic rifles. It fired a fairly low-powered cartridge, the .351 SLR. In addition to the obvious advantage of the self-loading mechanism, the M1907 featured several desirable attributes for military service including a detachable box magazine. It is not widely known that some selective-fire (fully automatic) versions of the SLR were also made. However, the relatively low power of the .351 cartridge prevented the weapon from being considered seriously as a military service rifle.

A later version of the SLR, the Model 1910, was introduced that featured a more powerful .401 caliber cartridge. While still nowhere in the class of the .30-06 or similar rounds, the .401 did pack a bigger punch than the .351. On September 1, 1915, the French Army ordered fifty M1910 SLR rifles from Winchester. These arms were equipped with 10-round detachable magazines. One hundred and fifty extra magazines were ordered along with 25,000 rounds of .401 ammunition.

(right) M1907 Winchester SLR (Self Loading Rifle), serial number 16482, as purchased by the U.S. Army in 1916. The weapon is fitted with an extended capacity magazine. The Army acquired about a dozen of these weapons for issue to the fledging Air Service. A much larger number of Winchester M1907 and M1910 SLR weapons were purchased by the French during WWI. The SLR was considered as a supplementary infantry weapon by the U.S. Army but the war ended before it could be thoroughly tested in this capacity. However, the SLR proved to be the forerunner of the famed M1 carbine of WWII. (Buffalo Bill Historical Center, Cody, WY. Gift of Olin Corporation, Winchester Collection)

(far right) This view shows the canvas bag fitted to such weapons for aircraft use. The bag caught the fired cartridge cases as they were ejected in order to prevent potential damage to the aircraft. (Buffalo Bill Historical Center, Cody, WY. Gift of Olin Corporation, Winchester Collection)

The exact disposition of these 50 rifles is not known, but Herbert G. Houze reports that they were issued to non-commissioned officers of the French Second and Fourth Armies assigned to the Champagne region. The French were apparently satisfied with the performance of the Winchester rifles, as a subsequent order was placed for 800 of the weapons with delivery to be completed by April 7, 1918. Winchester completed the order almost on time, and the last shipment was sent to the French on April 10. Again, specific information regarding the use of these rifles by the French is not known. However, it was reported that some members of the French First Army used the weapons during the Amiens Offensive in August of 1918 where they apparently performed satisfactorily.

In addition to being used by the French, it appears that some 250 M1910 SLR weapons were purchased by the Russian government in 1915. These arms were reportedly used by the Russians during the June 1916 offensive on the Eastern Front against Austrian troops. Some of these later found their way into the hands of the "White Russians" fighting the Bolsheviks during the 1919–1920 period. Although only some 1,200 or so M1910s were sold to foreign nations for military use, this represented almost half of Winchester's total production of the arm during the 1915–1918 period.

It is not believed that any of the Winchester M1910 SLR weapons were acquired or used by Americans during World War I. However, there was a small quantity of Winchester Model 1907 .351 caliber SLR weapons purchased by the Ordnance Department in 1916. A memorandum dated April 21, 1916, stated the following:

From: The Ordnance Office
To: The Quartermaster General, U.S. Army
Subject: Issue of Winchester automatic rifles to First Aero Sqd.

1. It is desired to make express shipment from Springfield Armory to the 1st Aero Squadron at Columbus, New Mexico, of 12 Winchester automatic rifles, caliber .351, 50 extra clips, and 5000 ball cartridges therefor. The Commanding Officer, Springfield armory has been directed to make this shipment and informed that such shipment by express has been approved by your office in accordance with telephone conversation of this day with Col. Baker.

WILLIAM CROZIER
Brig. Gen., Chief of Ordnance
By: (Signed)
Col. Ord. Dept.

The dozen M1907 SLR rifles were intended to arm the fledgling air service pilots involved in the "Punitive Expedition" against the bandit Pancho Villa. The expedition was commanded by John Pershing who was soon to be named the commander of the American Expeditionary Force after the United States' declaration of war against Germany.

Little has been recorded regarding the use of the .351 SLR rifles by our aviators in Mexico. It has been reported that the weapons were sent to France for informal testing and evaluation. The fact that some of the M1910 SLR weapons were used in ground fighting by the French undoubtedly resulted in the arm being considered for similar use by the U.S. Army. However, there are no records of any subsequent M1907 (or M1910) SLR weapons being procured by the American government.

Most, if not all, of the M1907 .351 caliber SLR weapons purchased by the U.S. Army for issue to the 1st Aero Squadron were selective-fire variants equipped with extended capacity detachable box magazines. In order to prevent ejected cartridge cases from hitting the propeller or other vital areas of the fragile airplanes of the period, a canvas bag was fitted over the rifle's ejection port to catch the ejected cases. The use of standard machine guns to arm aircraft rather than low-powered small arms soon rendered obsolete the practice of using weapons such as the SLR. A few weapons of this type were possibly used by some infantry personnel in the trenches for evaluation purposes, but this has not been confirmed.

In any event, the war ended before the concept of a light, compact self-loading rifle for military use could be fully evaluated by the U.S. Army, and the idea was not developed further. However, the concept was resurrected on the eve of the Second World War and culminated with the development and adoption of the famous .30 caliber M1 carbine. The M1 carbine was made and issued in huge numbers during WWII and continued to see use for many years afterward.

Although the Winchester SLR did not have any significant impact on the infantry tactics of World War I, the weapon did plant the seed for the M1 carbine less than twenty-five years later. Like the Winchester M1894 carbine, many people do not realize that the SLR was used during the First World War by the United States military. While greatly overshadowed by such rifles as the M1903 and M1917, these little-known but interesting civilian rifles should not be forgotten when examining the American military rifles of the First World War.

The Pedersen Device

Before we leave the subject of rifles altogether, there is one additional weapon to be examined — the "Pedersen Device." This fascinating weapon was envisioned as a "Top Secret" infantry weapon of the First World War and was slated to play a prominent role in the "Grand Offensive" scheduled for the spring of 1919. However, the war ended before the weapon could be issued to front-line troops and utilized in combat situations.

The device was conceived in the fertile mind of a noted arms designer of the period, John D. Pedersen. Pedersen had previously designed several noteworthy weapons including the Model 10 slide-action repeating shotgun and a semiautomatic pistol, the Model 51. Pedersen did most of his work while affiliated with the Remington Arms Company. During the late 1920s and early 1930s, Pedersen developed a semiautomatic service rifle at Springfield Armory that was a serious competitor to the M1 Garand.

The Pedersen Device was developed in an attempt to address two fundamental problems shared by all military service rifles of the period, including the M1903 Springfield. The '03, along with the other rifles, had two obvious drawbacks: the bolt action mechanism was slow to operate, and the service rifle cartridge (such as the U.S. .30-06) was overly powerful for some combat applications. These issues were discussed in an article in *Army Ordnance* magazine:

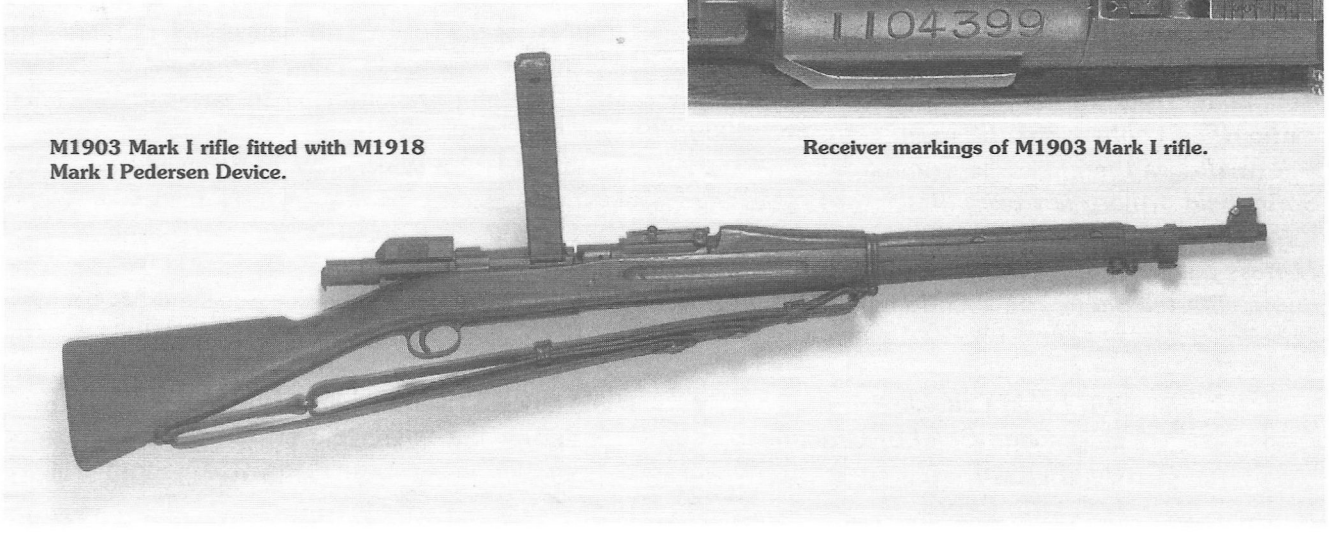
It may seem at first glance that the military rifle cartridge is unduly powerful but it must be remembered that this cartridge is intended to be used against various targets such as airplanes, armored cars, tanks, etc... These same bullets are used by machine guns for laying out barrages at long distances or for shooting at high flying aircraft.

Thus a soldier in firing his army rifle is frequently in a situation where he has more power in his bullets than he needs for a particular job in hand; moreover for each shot he must open the bolt of his gun and throw out the empty cartridge and then close the bolt and lock it before he can shoot another shot.

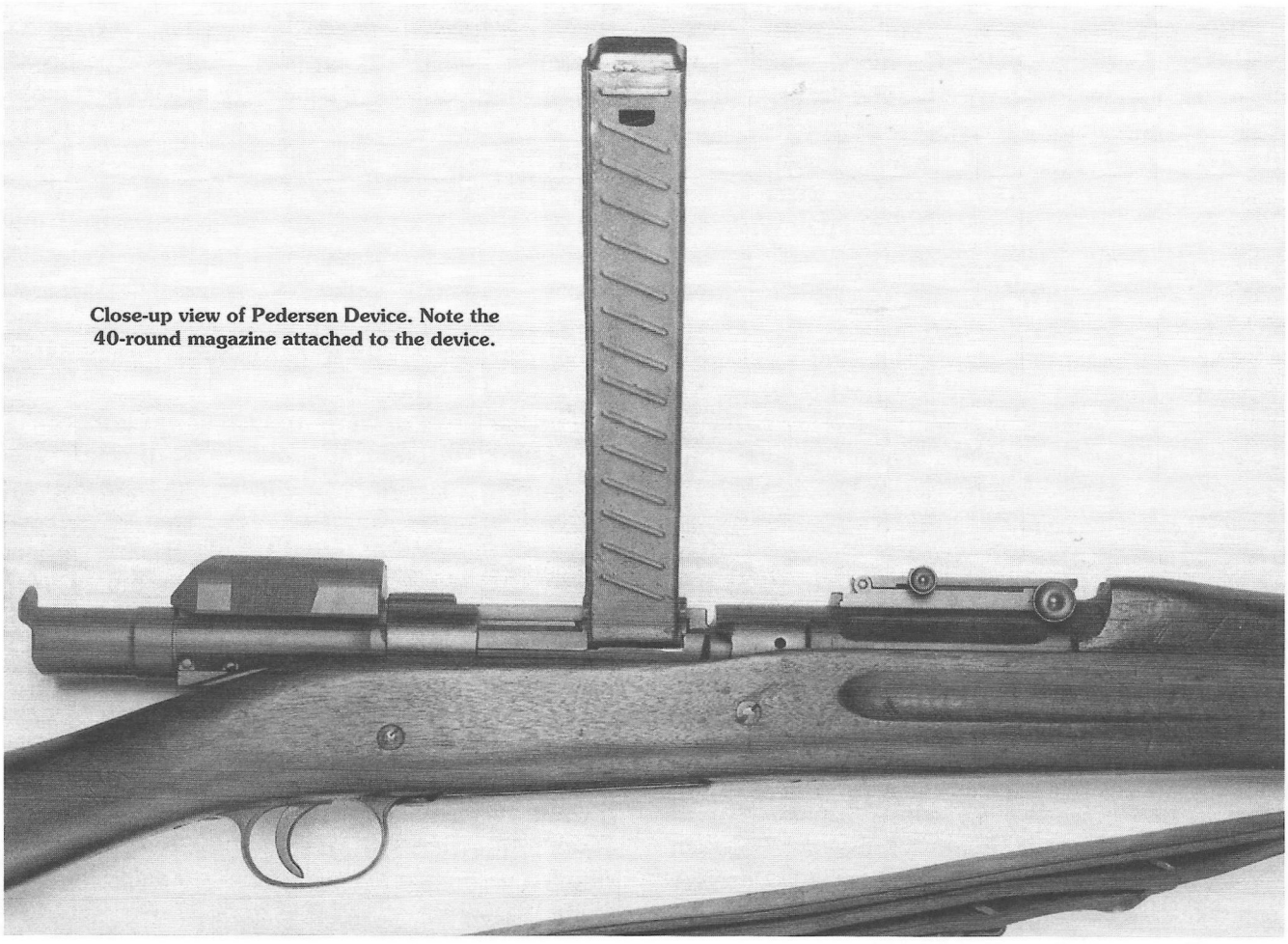
In other words, it was not always necessary that a soldier have a full-power cartridge, but there were times when such cartridges were indispensable. Also, a self-loading or semiautomatic rifle would have been extremely desirable, but no satisfactory weapons of this type capable of handling a full-power military cartridge were available. A suitable solution to these seemingly contradictory problems seemed unlikely. However, John Pedersen tackled the project in a very innovative and imaginative way.

Pedersen labored at his invention until the summer of 1917 when he contacted the U.S. Army Ordnance Department to request a secret demonstration of his new weapon. Pedersen's reputation was such that his request was soon granted, although the ordnance people had no idea as to the nature of his invention. On October 8, 1917, the Chief of Ordnance General William Crozier, along with a select group of officers

Receiver markings of M1903 Mark I rifle.



M1903 Mark I rifle fitted with M1918 Mark I Pedersen Device.



Close-up view of Pedersen Device. Note the 40-round magazine attached to the device.

and a few congressmen (all sworn to secrecy), met at the Congress Heights rifle range in Washington, D.C. The following details were related a number of years after the fact in an article in *Army Ordnance* magazine:

Mr. Pedersen started his demonstration by firing the Springfield rifle which be brought with him. After firing a few shots in the ordinary way he suddenly jerked the bolt out of the rifle and dropped it in a pouch which he had with him, and from a long scabbard which was on his belt he produced a mysterious looking piece of mechanism which he quickly slid into the rifle in place of the bolt, locking the device to the rifle by turning a catch provided for the purpose. Then he snapped into place a long black magazine containing forty small pistol size cartridges whose bullets were, however, of the right diameter to fit the barrel of the rifle. All this was done in an instant and in another instant Mr. Pedersen was pulling the trigger of the rifle time after time as fast as he could work his finger and each time he pulled the trigger the rifle fired a shot, threw out the empty cartridge and reloaded itself.

The assembled onlookers were amazed by Pedersen's demonstration, and the device was eagerly examined at length afterward. The mechanism was known as an "automatic bolt" which could be a bit misleading as it only allowed semiautomatic fire. The mechanism is widely known today as the "Pedersen Device." The device operated in essentially the same manner as a "blow back" pistol. The "barrel" of the device was rifled (with very shallow lands and grooves) and was the same configuration as a .30-06 cartridge case. This enabled it to fit into the '03's chamber and put the bullet in close proximity to the rifling of the standard '03 barrel. The device was locked in place by means of the '03's magazine cut-off (slightly modified). A small projection on the rifle's trigger moved forward with each pull to trip the device's firing mechanism. Therefore, each time the rifle's trigger was pulled, the device fired.

The Pedersen device was fitted with a 40-round magazine that attached to the right side of the device at about a 45 degree angle. The magazine was held in place by two spring-loaded "fingers." The position of the magazine allowed the rifle to be sighted in the normal manner. Fired cartridge cases were ejected through a hole milled into the left side of the receiver.

The cartridge used with the Pedersen Device resembled a Colt .32 ACP pistol round but differed a bit in size and ballistic capability. The diameter of the bullet was necessarily .30 caliber in order to be used in the '03's barrel. The round was loaded with approximately 3.5 grains of smokeless powder, which imparted a muzzle velocity of about 1,300 f.p.s. While this was a pistol-sized cartridge, the muzzle velocity was almost 50 percent greater than comparable rounds fired from a handgun.

The device was carried in a stamped, sheet metal scabbard. The rifle's standard bolt was contained in a canvas pouch when it was removed. Five Pedersen Device magazines were carried in a canvas pouch having separate compartments. The scabbards and both types of pouches were designed to be carried on the standard U.S. infantry cartridge belt. The device, complete with the metal scabbard, weighed about two pounds, two ounces. A fully loaded magazine weighed about a pound.

Those who witnessed Pedersen's demonstration quickly grasped the potential significance of the device. There was much concern in the United States at the time regarding new and innovative weapons used in trench warfare for conserving the lives of American fighting men. It was felt that the Pedersen Device could be an enormous asset for both offensive and defensive use. An ordnance officer made the following observations regarding the device's role in defense:

As the enemy came charging across No Man's Land each of our soldiers would start firing with this miniature machine gun and the entire zone in front of the trenches would be covered with such a whirlwind of fire that no attack could survive...

The same observer was equally enamored with the device's offensive capability:

...a line of soldiers advancing across No Man's Land firing this device at the enemy trenches as they ran would make it extremely difficult for anyone in the trenches to show his head or any part of his body. Of course, fire while running or walking would not be so accurate, but the tremendous number of shots would more than make up for any inaccuracies and the whole enemy trench system would presumably be smothered with a storm of bullets.

The War Department was sufficiently impressed with the preliminary demonstration of the device to order an ordnance officer, Captain J.C. Beatty, to France in November of 1917 to deliver an example of the weapon to General Pershing. Captain Beatty was sworn to secrecy, and the entire project was given a "Top Secret" status.

A board was convened by General Pershing on December 9, 1917, at Langres, Frances. The board consisted of four high-ranking army officers accompanied by Captain Beatty. The board supervised testing of the device for accuracy, penetration, rapidity of fire and endurance. After initial testing, the board in France generally agreed with the assessment of the ordnance people in Washington that the device could be of great value for both offensive and defensive use. General Pershing was very favorably impressed with the Pedersen Device. A confidential memo dated December 11, 1917, stated:

For the Chief of Staff and Chief of Ordnance

...Board recommends adoption of Pedersen attachment for rifle and the initial purchase of 100,000 of same. Great secrecy urged in connection with this device. Initial supply of ammunition 5,000 rounds per gun with daily supply of 100 rounds per gun. Strongly approve of device and believe it will materially increase efficiency of our infantry. Pershing

A subsequent memo from General Pershing stated that:

Desire 25,000 Pedersen attachments be held in reserve. Replacements 50% per year on devices and 200% on magazines. Request 40 magazines be shipped with each device. When will shipments be made? Pershing

General Pershing's "strong approval" of the device made the board's recommendation for adoption a foregone conclusion and cleared the way for the weapon to go into production.

In order to preserve and maintain the desired secrecy, the device was given the purposely misleading name of "Automatic Pistol, Caliber .30, Model of 1918" when the weapon was officially adopted. It is amusing to note that the War Department was criticized in some circles for adopting a new pistol, especially a puny .30 caliber pistol, when the standard M1911 .45 performed so well!

The initial order for 100,000 Pedersen Devices was placed with Remington Arms Company on March 26, 1918. The company was to receive a net profit of $2.00 per device and 3 cents per magazine. Mr. Pedersen was paid $50,000 for the rights to his device along with a royalty of fifty cents for each one manufactured. The government paid for all necessary machinery and equipment required by Remington to produce the Pedersen Device. The initial order for 100,000 devices was increased to 133,450. On May 24, 1918, Remington was given a contract to produce 800 million Pedersen Device cartridges. The cartridges were head stamped "RA" or "RAH" and dated

with the last two digits of the year of production ("18", "19" and "20" have been noted). The "RAH" head-stamped cartridges are believed to have been made at Remington's plant in Hoboken, New Jersey. The cartridges were packed in 40-round boxes so that each box would fill one magazine. Five boxes were packed in a 200-round carton and three cartons (600 rounds) were carried in a light canvas bandolier. Five bandoliers were packed in a wooden crate.

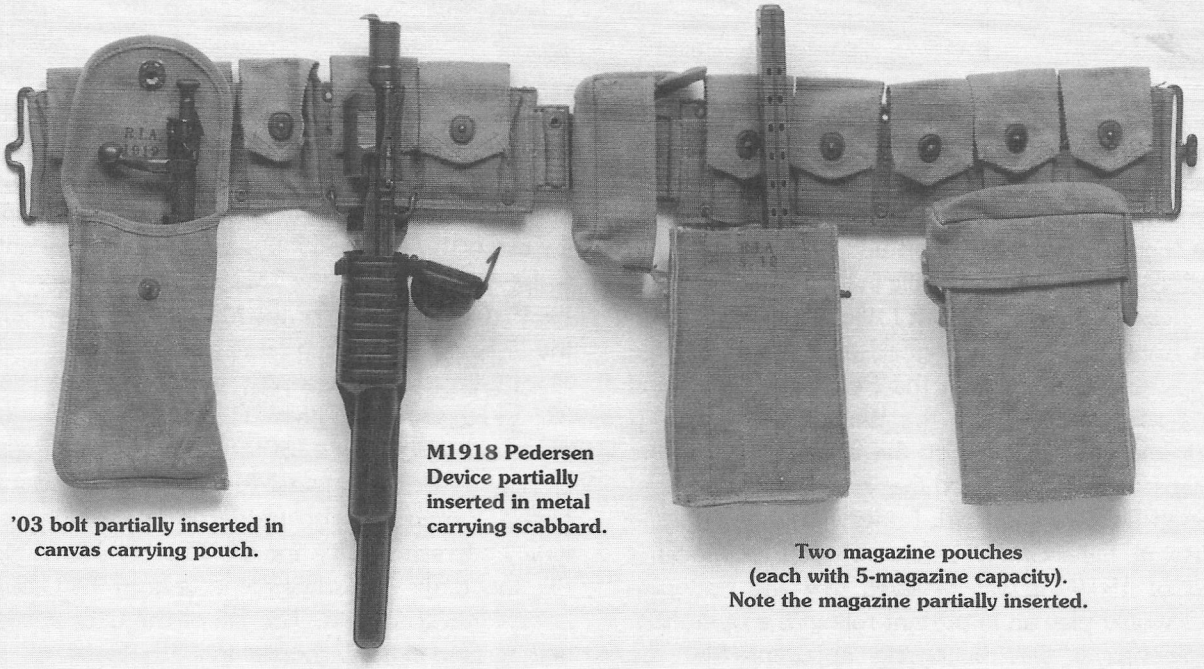
The Pedersen Device magazines were reportedly manufactured by the firm of Mt. Vernon Silversmiths with some components subcontracted to the Gorham Company. The magazines were constructed with viewing slots to determine the number of rounds left and were stamped with inspector initials. Five magazines were carried in a web pouch. The pouches were fitted with cartridge belt hooks. Two or three pouches could be carried on the cartridge belt. The pouches were made by Rock Island Arsenal and stamped with the date of production. Most seen today are dated "1919". A canvas pouch with a single snap hook was produced to carry the '03's bolt when it was removed from the rifle. The pouch was designed to hang vertically from the cartridge belt. Two stamped metal wrenches were issued with each device for adjustment and disassembly purposes.

The stamped metal carrying scabbards were reportedly manufactured by the Gorham Company. The scabbards were also fitted with cartridge belt hooks and had a hinged top with a wire closing latch. The scabbards were unmarked.

As Remington proceeded with plans to mass produce the Pedersen Device, Springfield Armory was directed to tool up for production of a modified M1903 rifle to use with the devices. The modified rifle was designated as the "U.S. Rifle, Caliber .30, Model of 1903, Mark I." The most apparent alteration to the standard '03 was an ejection port milled into the left side of the

Pedersen Device ammunition. Top, 40-round box with loose rounds; Bottom, Rare 200-round carton containing five 40-round boxes.

M1917 CARTRIDGE BELT WITH PEDERSEN DEVICE ACCESSORIES



'03 bolt partially inserted in canvas carrying pouch.

M1918 Pedersen Device partially inserted in metal carrying scabbard.

Two magazine pouches (each with 5-magazine capacity). Note the magazine partially inserted.

receiver. The stock was slightly inletted to provide the necessary clearance. The "Mark I" marking was added to the receiver ring. Other differences included changes in the trigger, magazine cut-off and sear. None of the alterations affected firing the rifle in the normal manner. Deliveries of the M1903 Mark I rifle began late 1918.

As Remington and Springfield were diligently making progress on producing the Pedersen Device and Mark I rifle for the AEF, the War Department was already making plans to use the weapon against the Germans. It was envisioned that sufficient numbers of Pedersen Devices and Mark I rifles would be on hand for use in the "Grand Offensive" planned for the spring of 1919. It was believed that the Pedersen Device would play an important role in the operation.

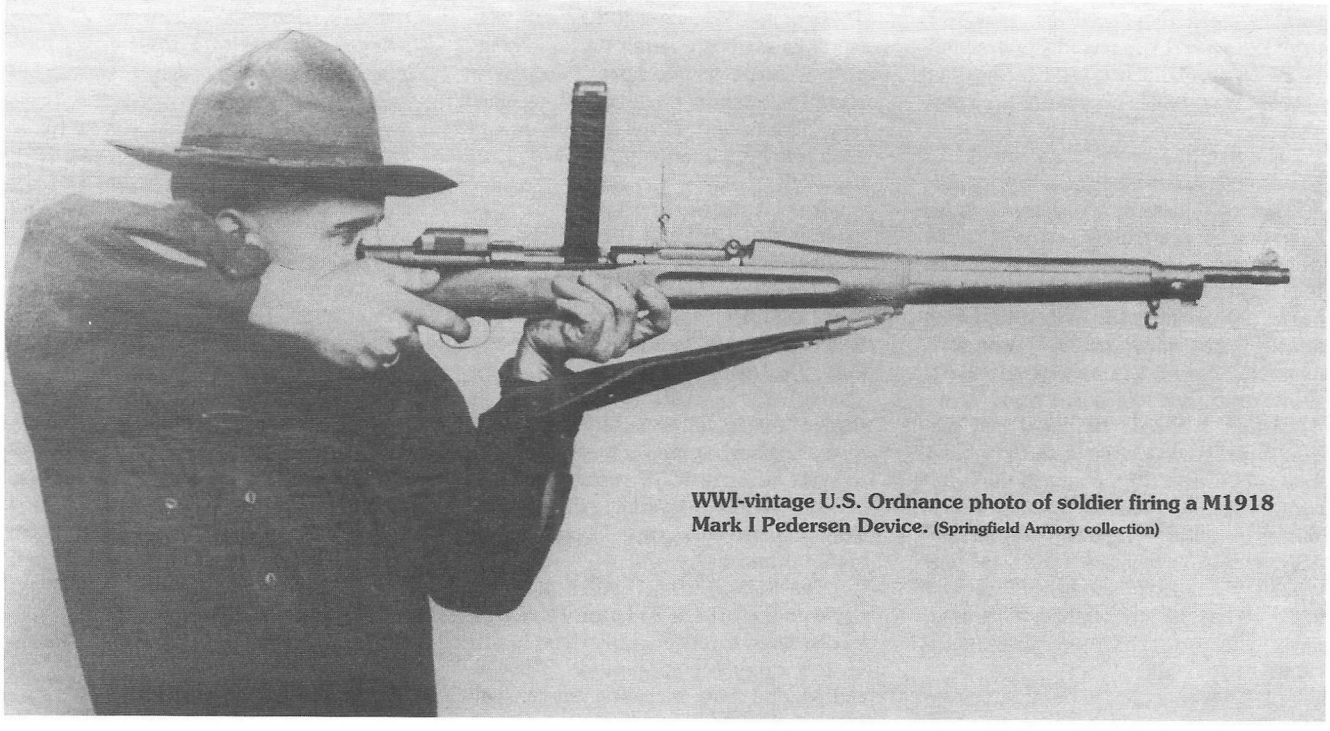
However, it was becoming apparent that the production of M1903 Mark I rifles would not be sufficient to meet this time frame. To this end, John Pedersen was requested to develop a version of his device for use with the M1917 Enfield rifle. This variant was to be designated as the "M1918 Pistol Mark II" and the Pedersen Device for the M1903 was designated as the "Mark I." Pedersen fabricated a prototype of the Mark II device that was satisfactorily tested on August 21, 1918. On September 20, Remington was given a contract to produce 500,000 Mark II Pedersen Devices after the original Mark I contract was completed. Remington also produced at least one prototype Pedersen Device for the Russian Mosin-Nagant rifle that differed in some respects from the U.S. Mark I and Mark II devices. The fall of the Czar spelled an end to Remington's hopes that the Russians would

also be buyers of the unique device. It is reported that a Pedersen Device for the French Berthier rifle was also contemplated, but it is doubtful if any were fabricated.

The Mark I Pedersen Devices and M1903 Mark I rifles were beginning to come off the assembly lines when the Armistice was declared on November 11, 1918. The pending contract for the Mark II devices slated for use with the M1917 Enfield was soon canceled with only a handful (probably less than a half dozen) being essentially hand-fabricated. Production of the Mark I devices continued until it was also cancelled on March 1, 1919, by which time some 65,000 had been manufactured along with 1,600,000 magazines and 65,000,000 cartridges.

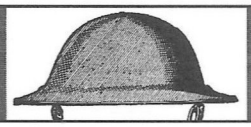
The War Department had these devices, but wasn't sure what to do with them since the war had ended. Another ordnance board was appointed to ascertain the Pedersen Device's future role, if any, and make recommendations regarding the subject. Tests were carried out by selected infantry units in France just after the war and at Ft. Benning and Ft. Riley in 1919 and 1920. All of the tests essentially agreed that the Pedersen Device was unlikely to be of use in future wars. The low power of the cartridge, the added weight of the device and related gear and the cumbersome changing back and forth of the device and the rifle bolt were all cited as deficiencies of the weapon. The "secret" status of the device was maintained following the war. With no future use of the Pedersen Device contemplated, the government decided in April of 1931 to destroy all devices, magazines and ammunition in order to save the cost of further storage. Most of the devices and accessories were burned and disposed of as scrap. Only a handful were saved for museums and reference collections. Of course, a few were also slipped into coat pockets or lunch boxes when no one was looking and carried away from the destruction sites. Surviving Pedersen Devices are quite rare and highly desired collector items. Most of the M1903 Mark I rifles were overhauled and converted to standard M1903 configuration by removal of the special Pedersen Device-related components. The unusual slot milled into the receiver was the cause of much speculation and mystery by troops issued the rifles since they had never heard of the Pedersen Device due to the secret status that remained in place until 1931.

Even though the Pedersen Device was conceived to be an important weapon in the trenches of France, this was not to be. It would have been a sight to behold if a half million Doughboys armed with Pedersen Devices rose from their positions and marched toward to German trenches firing the remarkable weapon. Instead, the Pedersen Device is but a footnote of ordnance history and a great example of how the United States desired to equip our troops with the most innovative and effective arms possible. Even though it was never used in combat, the Pedersen Device was a remarkable idea and a tribute to American ingenuity.



WWI-vintage U.S. Ordnance photo of soldier firing a M1918 Mark I Pedersen Device. (Springfield Armory collection)

Collector Notes



The United States military rifles of World War I are extremely popular with collectors today and are experiencing a steady increase in value. Although very large numbers were made during the war, most were subsequently overhauled for service in World War II. Examples remaining in their 1917–1918 factory condition can be surprisingly scarce today, and original specimens are highly prized.

M1903 Springfield

The increase in desirability and price is evident in the most famous American rifle of the war, the M1903. Specimens remaining in their original pre-1919 configuration are quite scarce today and very valuable. Some collectors only think of the rifles made during the 1917–1918 period as true "WWI" rifles but this is not correct. Any Springfield or Rock Island M1903 rifle made from circa 1906 to 1916 can also be properly classified as a World War I service rifle. These were the rifles in inventory when America went to war and were the first ones used "Over There." An '03 does not have to be made in the "war years" to be correctly considered as a WWI weapon.

There were many changes made to the '03 rifle during its production run that are too numerous to detail here. My book *A Collector's Guide to the '03 Springfield* covers these changes and the general time periods when they occurred. However, there are several key features that virtually all of the '03 rifles used in the First World War have in common. These include:

(1) External metal parts should be blued and not parkerized. Springfield Armory did not have its parkerizing operation in place until very late in the war, possibly as late as October of 1918. It is believed that Rock Island Arsenal began parkerizing their rifles at approximately the same time. Therefore, extremely few, if any parkerized M1903 rifles were sent to France prior to the Armistice. It should be noted that pre-WWII parkerizing has a distinctive black tint rather than the greenish-gray tint commonly observed on Second World War parkerized weapons. Any M1903 rifle with a parkerized finish (of any type) with a receiver and barrel date prior to 10-18 has been refinished. This obviously reduces its collector value significantly.

(2) The stock should be of the grasping groove variety (sometimes incorrectly referred to as "finger grooves"). Stocks made prior to the beginning of production until 1910 will have no stock screws (or bolts). From 1910 until 1917, the stock was fitted with a single screw to strengthen it. Circa late 1917 or early 1918, a second screw was added to further reinforce the stock primarily due to the recoil generated by use of the V-B rifle grenade launcher. Springfield Armory stocks normally had an inspector's cartouche consisting of three initials enclosed in a box stamped on the left side of the stock. Rock Island Arsenal stocks were stamped in this same location with a cartouche consisting of script initials and the date of production. Stocks lacking the proper cartouche are devalued quite a bit for collecting purposes.

(3) WWI and earlier vintage rifles were also equipped with handguards having a prominent "hump" to protect the rear sight. Post-WWI handguards were flatter in this area and would be incorrect for an "as issued" WWI rifle. The later pattern handguards were often fitted during overhaul and are a sign that a rifle has been modified from its original factory configuration.

(4) The barrels should match the receiver in both vintage and maker. For example, a barrel marked "RIA" should not be found on a Springfield receiver. There is no evidence that the two manufacturers swapped barrels during production as some people have theorized in order to "explain away" a mis-matched rifle. The vintage of the receiver can be ascertained by examining Table #22 on page 272.

It is interesting to note that '03 rifles made during 1917 and 1918 still in their original factory condition (blued finish, etc.) are less commonly encountered today than rifles made before 1917. This is, perhaps, a bit surprising, but it is true that '03 rifles manufactured in the "active" war years are harder to find than rifles of earlier vintages *still remaining in their original configuration.* As stated, the vast majority of '03 rifles made prior to 1919 have been overhauled. Unaltered examples in collectible condition are highly prized today.

The M1903 Mark I rifles made for use with the M1918 Pedersen Device (to be discussed shortly) are also hard to find in their original configuration. The special Mark I parts including trigger, cutoff, sear and stock were usually replaced when the rifles where rebuilt by the government during the 1920s, 1930s and 1940s. As originally manufactured, the M1903 Mark I rifles were parkerized (since production was post-October of 1918) although a number of parts, including some barrels, were blued. The parkerizing should be the WWI black tinted type.

The rifles are easy to identify due to the slot milled into the receiver, the "Mark I" marking added to the receiver ring and the special Mark I parts. The Mark I stock is characterized by a small inletted area underneath the receiver ejection port. Most Mark I rifles today have been overhauled one or more times, and the only original part often remaining is the receiver, and even this is invariably refinished.

25-Round Extension Magazine

An interesting and popular item with today's collector is the 25-round extension magazine discussed previously. As stated, some writers and collectors are of the opinion that this item is only proper for use with the "Air Service" rifle or the Cameron-Yaggi trench periscope rifle. However, all evidence points to the fact that the magazine was intended for wider distribution, although the war ended before it could be widely used in the trenches. Some collectors install these magazines in M1903 rifles fitted with Warner & Swasey musket sights, but there is absolutely no evidence that this is proper. The magazines can still be found today, often in their original brown cardboard boxes. Prices are rising and the supply is diminishing, but examples can still be located. If displayed in a WWI-vintage M1903 rifle, the extension magazine is an interesting addition to a collection and sure to elicit discussion.

M1903 "Air Service" Rifle

The relatively small number of '03 rifles modified for air service use are very rare and seldom appear on the market. Extreme caution should be exercised before purchasing a supposedly original example, as some fakes have been reported. The main things to look for are:

(1) Serial number range of about 857,000 to 863,000.

(2) Special shortened stock and handguard (not made from existing '03 wood).

(3) No sling swivels on stock or band.

(4) Solid lower band (not split as on standard '03).

(5) Modified rear sight with open notch.

If all of these features are not present or are suspect, it may be wise to pass on the purchase, especially if a large sum of money is involved as is normally the case.

Sectionalized Rifles

Although extremely interesting and scarce items, sectionalized rifles are not hugely popular with many collectors. Part of the reluctance to pay large sums of money for WWI-vintage sectionalized rifles is the fact that the arms were usually made from existing service rifles. Therefore, a very competent machinist today could duplicate the machining cuts necessary to produce a sectionalized '03 or other rifle. In any event, a sectionalized rifle is a very colorful addition to a collection, and examples appearing to have quality workmanship and fairly priced should be obtained whenever possible.

The many variants of the M1903 rifle make it an ideal collecting theme that has strong support and is growing in popularity. An unmodified example in decent condition is a great investment that will surely continue to appreciate in the future while bringing much pleasure to the collector. Pre-1919 '03 rifles are among the most desirable of all U.S. martial arms today and will likely remain such for many years to come.

M1917 Enfield Rifle

Until the past few years, the M1917 was primarily viewed as a rifle to customize into a sporter. There was little collector interest in the weapon, and prices remained essentially static for many years. Recently, the M1917 has begun to come into its own as a desirable collector's item. Although almost two and a half million were made, examples in collectible condition remaining in their original factory configuration are surprisingly hard to find today. As was the case with the M1903, the vast majority of M1917 rifles were overhauled and refurbished following the First World War. Large numbers were again rebuilt during WWII and fitted with replacement barrels. The unmodified 1917–1918-vintage rifles are becoming recognized as scarce and quite desirable martial arms, and prices are reacting accordingly. Some surprisingly high prices have been paid recently for pristine examples. The WWII rebuilt rifles are still not very popular with collectors, although there are signs that this trend is also changing.

For someone desiring to obtain an original WWI-vintage M1917 rifle, there are several key features to observe:

(1) The finish on external metal parts should be an attractive rust blue. Only Eddystone M1917 rifles manufactured after circa November of 1918 were parkerized at the factory. However, the vast majority of M1917 rifles seen on the market today will have parkerized finishes due to the widespread rebuild programs following WWI.

(2) Letter code markings should match on all components. Most of the parts of the M1917 rifle were stamped with the first letter of the manufacturer ("W", "R" or "E"). When the rifles were overhauled, mixed parts were installed, so any non-matching components are evidence that a rifle does not remain in its original factory configuration. Some people have theorized the three manufacturers swapped parts to ease inventory problems, but there is no evidence that this occurred. Such claims are usually someone's attempt to justify non-matching parts on a rifle. Some M1917 rifles may be observed with bolts stamped "USMC". Some people have reached the logical, but erroneous, conclusion that such rifles are some sort of rare and desirable variant made for use by the United States Marine Corps. Actually, such bolts were made after the war by the United Shoe Machinery Company as replacements for overhaul purposes and indicate that a rifle fitted with such a bolt is a rebuild.

(3) Stocks should have the proper markings. There were several types of inspection markings applied to stocks during production. The most commonly encountered type consists of an "eagle head" marking with letter and number codes. Other small factory markings were often applied on the bottom of the stock forward of the magazine. When the weapons were overhauled after the war, all manner of inspection cartouches (usually enclosed in a rectangle) were applied to the stock. Such markings are a sure sign tht a a rifle has been rebuilt. It should be remembered that the initial of the manufacturer should also be found on the tip of the stock. Replacement stocks in near-new condition (without markings) are still around today. A pristine stock lacking the proper markings teamed with well-used metal is evidence that a replacement stock has been added.

There are few recognized variants of the basic M1917 rifle. The Remington-made M1917 rifles with factory adjustable sights are quite uncommon, but prices do not yet reflect this fact. As this variant becomes better known and collectors begin to seek examples, prices are sure to rise well beyond the premium typically paid today. Someone evaluating such a rifle should be certain to determine that all parts match (i.e., are marked "R") and the unique rear sight is the factory type rather than some sort of "aftermarket" replacement. The photos on page 84 illustrate the correct sight.

The M1917 bayonet and scabbard are discussed in a previous section of this book and will not be revisited at this time. The stamped sheet metal magazine depressor is not rare, but examples can be difficult to find. Such an accessory would be an interesting addition to a collection. The cartridge belts used with the M1917 rifle are the same as utilized with the M1903. A collector desiring a belt for display with a WWI rifle should be sure it is properly dated. The M1907 leather sling (with brass hardware) or the M1917 Kerr sling would be correct for use with U.S. Enfields. As mentioned, use of the Kerr sling was likely restricted to stateside, so someone wishing to depict a rifle as used in combat should obtain a M1907 sling of the proper vintage. Be wary of M1907 slings that look "too new" as there are a number of fakes around, most dated "1918".

M1917 rifles in excellent or better condition remaining in their original configuration (blued finish, etc.) are very attractive rifles that stand out in marked contrast from a typical overhauled and parkerized specimen. Such examples are sure to continue to increase in desirability and value in the years to come. The M1917 is worthy of the appellation "The Doughboy's Rifle."

U.S. .30-40 Krag Rifle

A collector wishing to acquire an example of a M1898 or M1896 Krag as a supplemental World War I U.S. rifle will likely not have a hard time finding a nice specimen. To date, there have been few problems encountered with fake Krag rifles (the same can't be said for Krag carbines) and the most commonly encountered problem is refinishing. A refinished example can normally be spotted rather easily. Generally speaking, any M1898 or M1896 U.S. Krag rifle remaining in its original factory configuration can serve as an example of a WWI supplemental arm. There are no known serial number lists of the Krag rifles brought back into service during the First World War.

The .30-40 Krag ammunition made during WWI can still be found from time to time today. The most desirable type of

WWI Krag ammunition is the full bandoliers with 1917 dates. Such a bandolier can make an interesting companion to a Krag rifle in a WWI U.S. collection.

The Krag rifle is not usually thought of as a weapon of the First World War but, as we have discussed, it did provide useful, if unheralded, service during this period.

Ross Rifle

The Canadian Ross rifles acquired by the United States during WWI are easy to identify. The only distinguishing markings are the "US" and "flaming bomb" stamped on the bottom of the stock in the pistol grip area. There are normally many other types of markings, including serial numbers, stamped on the stock in various places, but these are normally Canadian military markings.

The U.S.-surcharged Ross rifles are not rare but can be somewhat difficult to find today. Absolutely pristine examples are very uncommon, as most observed specimens saw hard use. As mentioned, the Ross rifles taken into United States service during the First World War were usually fitted with M1917 Kerr slings.

Even though it was never used in combat by American troops, the Ross rifles with U.S. military markings are interesting weapons and worthwhile additions to a WWI collection.

Mosin-Nagant Rifle

The Mosin-Nagant rifles made by Remington and N.E. Westinghouse were the weapons issued to American troops for training purposes and as supplemental service rifles. Although large numbers were made, these rifles are not extremely common today but do show up from time to time on the collector market. The "US", "eagle head" and "flaming bomb" markings stamped on the bottom of the stock forward of the magazine are the only means to identify the rifles purchased by the United States government during WWI. Most components were marked with the rifle serial number, so a collector should be certain that a weapon does not contain mis-matched parts.

It is not uncommon to find U.S.-surcharged M1891 Mosin-Nagant rifles in very good condition today, as some were apparently stored by the government and not issued. Mosin-Nagant rifles made by various Russian armories are quite common today but would not be correct for display in a U.S. WWI collection. Prices for the U.S.-surcharged Remington and Westinghouse rifles are about the same given comparable condition.

Mosin-Nagant bayonets can typically be found without a great deal of trouble. Many are serially numbered but matching rifle and bayonet numbers are very much the exception and not the rule. The general condition of the bayonet should match that of the rifle. 7.62mm Russian ammunition produced in the United States is a nice addition to a U.S. military Mosin-Nagant rifle. The ammunition was issued in 20-round white cardboard boxes with small lettering on the top. The most commonly encountered head stamp for such ammunition is "Remington — 1917".

A U.S.-surcharged Mosin-Nagant rifle is an excellent weapon for an American First World War martial arms collection. What makes it a noteworthy combat arm is the fact that the weapon served U.S. troops in combat during a little-known war against the fledgling communists in Russia. It is also an excellent example of a foreign rifle pressed into service as a training weapon during WWI.

French Lebel and Berthier Rifles

Unlike the Canadian Ross and Russian Mosin-Nagant rifles discussed previously, the French Lebel and Berthier rifles used by American troops were not stamped with U.S. markings. This is because the Americans who served with French units were issued standard French rifles that were not the property the United States. Therefore, there is no way to determine if any specific Lebel or Berthier rifle was utilized by black American troops assigned to the French during the First World War.

The French military rifles have never been very popular with collectors in the United States. Decent examples can be found today but are less common that many other types of foreign military rifles. Probably the most popular type are the rifles made under French contract in the United States by Remington. However, the American-made rifles were issued concurrently with the French-made rifles, and either type could conceivably have been used by Americans assigned to French infantry units.

A nice WWI-vintage Lebel or Berthier rifle would be an interesting acquisition (if reasonably priced) to depict the weapons used by Americans who were required to serve under foreign command during the war. While not issued as a combat arm to United States infantry units under American command, the French rifles were nevertheless carried by brave Americans who fought valiantly against the enemy.

British SMLE Rifles

The British SMLE rifle, like the French Lebel/Berthier, was not acquired by the United States for issue to regular infantry units. Rather, the weapon was issued to Americans assigned to British units for training and "familiarization" purposes. These rifles were not stamped with any sort of U.S. military markings, as they remained property of the British government.

First World War vintage Mark III Lee-Enfield rifles are commonly found on the collector market today, although "mint" examples can be tough to find. As stated, there are no defining characteristics to determine if a specific rifle of this type was one of the weapons temporarily issued to American troops serving with the British. A collector wishing to acquire an example for display in a U.S. WWI collection should be certain that the rifle remains in its original 1916–1918 condition and has not been subsequently altered.

Even though such a rifle will not bear any U.S. military markings, it can serve as yet another example of how America was, out of necessity, forced to "borrow" weapons from our allies during this time. Some casual observers may question why foreign arms such as French and British rifles are in a collection of WWI U.S. martial arms. The knowledgeable collector can take such an opportunity to give a brief history lesson on the subject. The use of allied weapons was vital to the success of the American effort during World War I. This fact is sometimes forgotten today, and such rifles as the British SMLE can help illustrate the lesson.

SNIPER RIFLES

For today's collectors, World War I sniper rifles are among the most popular of all the U.S. weapons. Unfortunately, the problem of fakes is a serious one due to this popularity and, consequently, typically high prices.

The most commonly found U.S. WWI sniper rifles are the M1903 Springfields fitted with M1913 Warner & Swasey musket sights. The earlier W&S M1908 sights are much less commonly found, but many of the same caveats as will be discussed about the M1913 variant also apply.

As mentioned, the United States acquired several thousand W&S M1913 sights. A number of these were mounted on select M1903 rifles at Springfield Armory prior to and during the First World War. The serial number of the rifle, with which a particular scope was fitted, was stamped inside the mount's dovetail recess. Although regulations called for the rifles and scopes to be kept together, this was almost never done, and mixed numbers are the norm on almost

all original rigs of this type found today. A matching scope and rifle combination would be an extreme rarity. However, since a large number W&S M1913 sights were never fitted to rifles and were not serially numbered, there is a very real possibility that, in attempting to defraud an unsuspecting buyer, a surplus scope of this type could have a rifle serial number stamped in the recess. Such markings should be examined for evidence of hand-stamped markings. The original numbers were fairly well aligned rather than crudely stamped as typically found on the fakes. Also, the size and configuration of the serial number should be compared, if possible, with a known original.

Surplus W&S M1913 sights and receiver mounting bases have been on the market for many years and can still be found today, although prices are usually rather steep. It is not too difficult to have a gunsmith mount the base on the left side of the receiver. The originals had a small amount of wood removed from inside the left side of the stock in order to provide clearance for the base. Many fakes will show crude workmanship in this area. All features of the rifle should be consistent with standard M1903 rifles from the 1916–1918 period. The earlier M1908 W&S sights were fitted to rifles made prior to 1913. It should be noted that all originals were Springfield Armory production, and no Rock Island '03s ever had Warner & Swasey sights fitted. Any RIA '03 with a W&S sight attached is a fake.

The most desirable M1913 W&S sights will have a rifle serial number stamped inside the mount recess, which indicates the scope was fitted to a rifle and issued. As stated, the rifle serial number and the serial number stamped inside the recess do not have to match for the weapon to qualify as an original. The W&S factory serial number stamped on the outside of the sight body does not have any relation to the rifle serial number. While many M1913 W&S sights not stamped with rifle serial numbers will be found, it is believed that all M1908 W&S sights were issued and numbered.

The rubber eyepiece of the W&S sights was prone to deterioration and was often cut-down or removed in the field. Some reproductions have been available for a number of years. These can be identified, as they were made of black rubber rather than the green-tinted rubber found on the originals. Likewise, some reproduction sight wrenches may also be encountered. The leather carrying cases are still around and are usually not too difficult to find at reasonable prices. The leather M1907 sling was the type normally issued with the M1903/W&S sniper rifles.

Any purported original M1903 Springfield rifle with a M1913 (or M1908) Warner & Swasey musket sight offered for sale should be examined very closely. Be sure that all features of the rifle are consistent with the time period, that the recess has an '03 serial number stamped inside (even if it doesn't match) and the manner in which the left side of the stock is beveled inside to provide clearance. There are an extreme number of fakes around and one cannot be too careful. An original example of a M1903/W&S WWI sniper rifle is a great find and a colorful (and valuable) addition to a collection.

M1903 Rifle with Winchester A5 telescope

The few M1903 rifles fitted with Winchester A5 telescopes by the Marine Corps (along with a handful by the Army) can be even more difficult to properly evaluate than the '03s fitted with Warner & Swasey sights. The Marines were rather inconsistent in the precise manner that the A5 scopes were mounted, and a great deal of variance may be encountered even among totally original specimens. The rifles modified during the 1917–1918 period and fitted with the special Mann-type tapered mounts are probably the most popular and will usually show more consistency than the rifles fitted with A5 scopes previously.

The major things to observe are the features of the rifle to be sure they are proper for the time period and the manner in which the handguard was modified to allow clearance for the front scope mount. Marine Corps rifle team's weapons fitted with Winchester A5 telescopes prior to 1917 used several types of commercial mounts and were essentially modified on an "as needed" basis my marine armorers. Stating that a pre-1917 M1903 fitted with a Winchester A5 scope is categorically "not correct" is dangerous, as there are simply too many variables involved to make a lot of sweeping statements. Therefore, a rifle of this period may not have as high of a price as other more common sniper rifles that can be identified as original with a bit more certainty.

The leather carrying cases issued with many of the WWI-vintage Marine Corps A5 scopes are quite desirable additions to a rifle of this type. Slings and oiler/thong cases issued with these rifles were the same type as used with standard M1903 service rifles.

The '03/Winchester A5 rifles are very interesting and little-known sniping variants that saw limited service during the First World War and are desirable U.S. martial collectibles today.

"Model of 1918" Sniper Rifle

A collector should not knock himself out trying to find an example of the modified M1917 rifle that was slated to become the "M1918" sniper rifle. As discussed, other than a handful of prototypes, few weapons of this type were made. The few originals that are known reside in museums or reference collections. It is always possible that an original survived. However, none have been reported, and the odds of a previously unknown specimen turning up today are extremely remote. The correct "M1918" telescope is probably as rare as the rifle, so finding an example is going to be equally unlikely.

It is possible that someone could attempt to modify a M1917 service rifle today to resemble the ultra-rare M1918 prototype sniper. Fakes of this type have not yet been reported. The specially made stocks and scope mounts would be quite hard to fake but one should always be vigilant. Any purported original rifle and/or scope of this type should be approached with extreme caution. The original "M1918" rifle (without scope) from the Winchester collection pictured on page 108 should be examined very closely to determine the correct features.

Any original M1903 variant World War I vintage sniper rifle is a wonderful collector item and an historically significant weapon. Military sniper rifles have been very popular with collectors for many years and this trend is sure to continue well into the foreseeable future.

"Trench Periscope" Rifles

The Cameron-Yaggi "trench periscope" M1903 rifles are extremely rare items although a small number are known to be in private hands today. The Guilderson rifles based on the M1903 and/or M1917 rifles are also very scarce outside of government museums.

It is estimated that perhaps a half dozen or so Cameron-Yaggi rifles exist in the hands of collectors today. Some of these are known to be missing all or portions of the periscope sight or other components. The number of complete units is quite small. Bogus Cameron-Yaggi rifles are not a problem since making a realistic fake would be difficult, and there are few originals from which to copy.

If an original Cameron-Yaggi rifle should be found, it could be a centerpiece to a WWI U.S. martial collection as well

as a very rare and fascinating weapon. Determining a reasonable price would be difficult, as there are no (or very few) sales figures with which to compare. However, such a weapon likely wouldn't be very cheap!

U.S.-Surcharged Winchester M1894 Carbine

The Winchester M1894 carbines with "US" and flaming bomb markings are fairly uncommon but can usually be found with a bit of looking and a lot of patience. Identification is straightforward, as the only difference between the rifles and standard production M1894 carbines of the same period are the added martial markings. The "US" and "flaming bomb" were hand-stamped and are not very well aligned when compared to factory machine-stamped markings. The serial number range of the M1894 carbines is approximately 835800 to 852500. It is possible that someone may attempt to hand-stamp the martial markings to a standard M1894 carbine. If such a weapon is found with a serial number well outside this range, it should be looked at with suspicion even if it does have the correct type of martial markings added. Original examples were chambered for the .30-30 cartridge, as this was the round specified in the government contract.

Apparently, most of these weapons were not turned in to the government after the war and saw hard use as sporting arms over the next seventy or eighty years. Most surviving examples will evidence much wear to the wood and metal. Pristine examples are very hard to find.

Some people may wonder why a common civilian arm such as the Winchester M1894 carbine is in a collection of U.S. WWI-vintage martial arms. Such weapons are interesting example of civilian guns "drafted" into government service. While they weren't sent overseas to fight the Germans, such guns did enable more of the standard M1903 and M1917 rifles to be available for such purposes.

Winchester M907 SLR Rifles

None of the dozen Winchester M1907 SLR weapons acquired by the army in 1916 to arm the fledging air service have been documented in private hands today. There are no details available that would help identify a specific 1916-vintage SLR as one of this elite group. It is believed that the rifles were all selective-fire weapons and would be subject to provisions of the National Firearms Act (NFA), which will be discussed later. It has not been confirmed that the twelve SLR weapons were stamped with any sort of marital markings after they left the Winchester factory. Although interesting and historically significant, it is extremely unlikely that any of these rare U.S. Army SLR rifles will ever be available to today's collectors. Except for one or two in museum collections, the remaining handful was likely destroyed long ago.

Pedersen Device

Of all the myriad accessories produced for the M1903 Springfield, few are as impressive (or valuable) as the Pedersen Device. There has always been a great deal of misunderstanding and confusion regarding this fascinating weapon. Surviving examples are very uncommon but are probably not quite as rare as many people believe. There are many estimates regarding the number in private hands today. The most credible guess is that two to three dozen complete examples exist. Conditions range from pristine to burnt-out hulks. Many devices are missing a magazine. This devalues an example substantially for collecting purposes. The metal carrying scabbard is even rarer than the device, and a number are missing this accessory as well. The magazine pouches are very common and the bolt pouches can also be found. Forty-round boxes of .30 Pedersen cartridges are not normally too difficult to find, but the 200-round cartons and bandoliers are rather rare. The wooden ammunition packing crates are also extremely rare. The prototype "Mark II" devices intended for use with the M1917 rifle are among the rarest of all U.S. martial items and only one or two have ever been sold (for extremely high prices).

The price of an original Pedersen Device should be determined by the condition and the number of accessories, particularly magazines, included. The metal carrying scabbard will also add substantially to the value.

Fake Pedersen Devices have not been a problem, although some examples have supposedly come on the market. There are reportedly some substantial differences between the reproductions and the originals to preclude passing them off as the "real thing." It would probably be unwise to invest a substantial amount of money in a reproduction Pedersen Device. Such an item is not real and never will be, so its real purpose and appeal are unclear.

An original Pedersen Device with a Mark I rifle is among the most eye-catching and valuable of all the WWI-related items. While not used in combat, it is an impressive symbol of the ingenuity and resourcefulness of American inventors and industry.

All of the United States rifles of the First World War are popular with collectors, and this popularity increases every year. The rifles used by our Doughboys are certain to enjoy an enormous amount of collector interest well into the future.

Shotguns

One infantry weapon used in the First World War was uniquely American. That weapon was the combat shotgun. Although shotguns had been used for fighting purposes for well over a hundred years, the weapons were usually civilian guns carried on an individual or, at best, a quasi-official basis. Short-barreled percussion shotguns were used (primarily by Confederate cavalry) during the Civil War with awesome effectiveness on many occasions. Some cavalry troopers carried their pet double-barrel shotguns during the "Indian Wars" as well. Although a few shotguns were officially purchased by the Army for "foraging" purposes, most of the weapons used in combat were privately owned arms. Shotguns were justly noted for their brutal effectiveness as fighting arms. As aptly stated in a 1920 *Harper's Pictorial* article:

...(the shotgun) is not a new man-killing arrangement. For years, the sawed-off shotgun has been the favorite weapon of the American really out gunning for the other fellow or expecting the other fellow to come a-gunning for him.

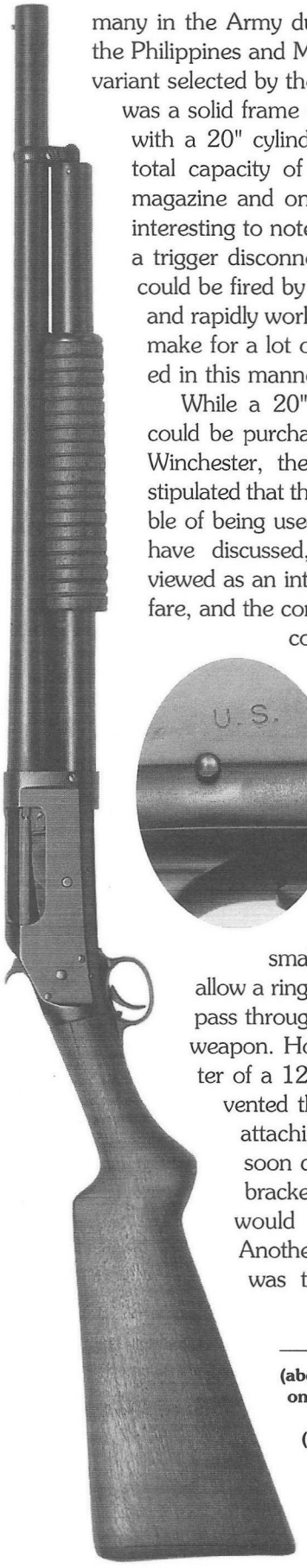
The first known procurement of shotguns by the United States, specifically for combat purposes, occurred around the turn of the century, when several hundred commercial Winchester Model of 1897 slide-action ("pump") repeating shotguns were purchased by the War Department. These shotguns were acquired specifically for close-quarter combat with the fierce "Moro" tribesmen of the Philippines during the period following the Spanish-American War. Little is known regarding these early U.S. military combat shotguns other than that they were standard Winchester M1897 12-gauge guns with "riot" length (20") barrels. These short-barrel shotguns loaded with 00 buckshot shells soon proved to be awesome weapons for close-range combat use. Some of these weapons were also reportedly used during the 1916 "Punitive Expedition" to Mexico.

When the United States entered World War I, General Pershing and the Army General Staff were determined not to make the same terrible mistakes that the other belligerents had made during the first three years of the war. The protracted back-and-forth assaults on well-defended trench positions had proven to squander many lives unnecessarily. This issue was discussed in an article published in *American Rifleman* magazine following the war:

When the A.E.F. began to take over portions of the front lines it brought with it General Pershing's predetermined decision to break up the enemy's use of its trenches as take-off points for such assaults, to destroy such attacking "shock troops" as they came on, and so to compel that open-ground warfare for which Europeans had little liking but which was wholly in the character of the American spirit and in which it was foreseen the latter would give an extremely effective account of themselves.

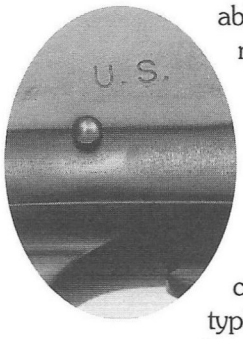
Many of the senior officers serving in the AEF, Gen. Pershing included, had not forgotten the effectiveness displayed by the short-barrel riot guns almost two decades earlier in the Philippines. It was soon decided that the shotgun could be used as an effective trench warfare weapon in some applications, both offensive and defensive.

With the decision made to field a combat shotgun for the AEF, the Ordnance Department began to evaluate what type of weapon would best suit the needs of our troops deploying to France. An Ordnance Department committee was formed to evaluate various designs, and recommend to the War Department what type of weapon should be standardized as America's first official combat shotgun. It was quickly agreed that the battle-proven and reliable Winchester Model 1897 would be the selection of the committee. The M1897 (later termed the "M97") had been in production for some twenty years and was a well-known weapon to



many in the Army due to its employment in the Philippines and Mexico. The Model 1897 variant selected by the Ordnance Department was a solid frame (i.e., non-takedown) gun with a 20" cylinder bore barrel having a total capacity of six rounds (five in the magazine and one in the chamber). It is interesting to note that the M1897 lacked a trigger disconnector; thus, the weapon could be fired by holding back the trigger and rapidly working the slide. This could make for a lot of firepower when wielded in this manner.

While a 20" barrel riot gun version could be purchased "off the shelf" from Winchester, the Ordnance Department stipulated that the new gun must be capable of being used with a bayonet. As we have discussed, bayonet fighting was viewed as an integral part of trench warfare, and the committee felt that the new combat shotgun must be able to mount a bayonet to be a truly effective weapon for such use. This apparently simple requirement posed some intriguing problems for the designers of the new combat shotgun. The typical rifle barrel was small enough in diameter to allow a ring on the bayonet guard to pass through, thus securing it to the weapon. However, the large diameter of a 12 ga. shotgun's bore prevented this traditional method of attaching a bayonet. It was soon determined that an offset bracket for mounting a bayonet would be the best solution. Another problem to overcome was the fact that a shotgun barrel would become very hot after firing only a few shots. If a bare hand was placed upon a barrel after firing, a painful burn could result. It obviously would be impossible to use the shotgun for bayonet fighting without being able to grip the barrel in such a manner. It was decided that a ventilated metal handguard that allowed air circulation between the guard and the barrel would provide the necessary protection. Springfield Armory was directed by the Ordnance Department to consult with the Winchester Repeating Arms Company to develop a satisfactory bayonet adapter and handguard assembly. This was done in short order, and the proposed new combat shotgun was submitted to the Ordnance Department for consideration and approval. The weapon, soon dubbed the "trench gun," was a Winchester M1897 12-gauge "riot gun" fitted with sling swivels and the newly developed handguard/bayonet adapter assembly. The new weapon was assigned the code number "G-9778-S."



(above) Martial markings found on WWI-era M1897 riot gun.

(left) WWI-vintage Winchester M1897 riot gun. Unlike the trench gun, the riot gun was not fitted with the ventilated metal handguard/bayonet adapter or sling swivels.

WWI-vintage U.S. Army photograph showing a guard at the War Prison Barracks, Ft. Oglethorpe, Georgia, armed with a Winchester Model 1897 riot gun. Note also the M1914 machine gun in the background. (National Archives)

It was decided to equip the new "trench gun" with the M1917 Enfield rifle bayonet due, presumably, to the larger numbers on hand. Another consideration that possibly weighed in favor of adopting the M1917 bayonet was that it was made by Winchester, the same firm that was to manufacture the trench gun. WWI Ordnance Department documents indicate that the trench guns were to be issued to infantry units

May 11, 1918 SCIENTIFIC AMERICAN

The Shotgun's Debut as a Military Weapon

ONE war suggestion which has been put through in record time is the shotgun. For experts and soldiers at various times have urged the employment of the repeating shotgun both for our aviators and our infantry, ever since we entered the war; and now General Pershing's men are using a military shotgun.

The new weapon is a comparatively short repeating shotgun of the pump-action type, holding six shells in its magazine. Each shell is of the paper kind such as is used in sporting shotguns, and contains nine pellets of No. 00 buckshot, or about the size of a .32 caliber bullet. When fired the new American gun sprays the contents of each shell over an area measuring nine feet horizontally and about three feet vertically, so that it is almost impossible not to hit a large number of enemy infantrymen coming to the attack in the typical mass formation of the Germans. As for the penetrating power of the buckshot, it is reported that during a recent test the hail of lead went through a two-inch plank with plenty of energy left for further damage, at 150 yards from the muzzle.

One of the problems which had to be solved in adapting the shotgun to military practice was that of the bayonet. The shotgun barrel is quite thin, so much so, in fact, that it would not offer sufficient support for bayonet work. This difficulty was overcome, however, by providing the shotgun with an outer steel coat or jacket which, being perforated and held a short distance away from the barrel proper so as to form an air space, acts as a cooling member while affording rigid support for the bayonet.

The American Army shotgun weighs 8¾ pounds, complete with bayonet. It is equipped from muzzle to stock with a leather rifle sling so that it may be slung over the neck and shoulder.

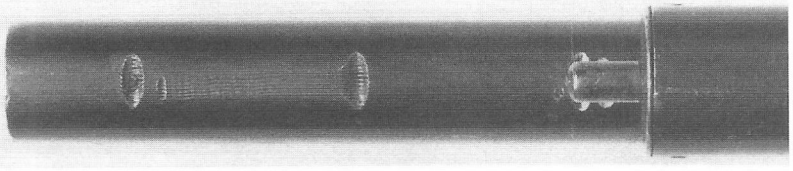
Courtesy N Y. Sun

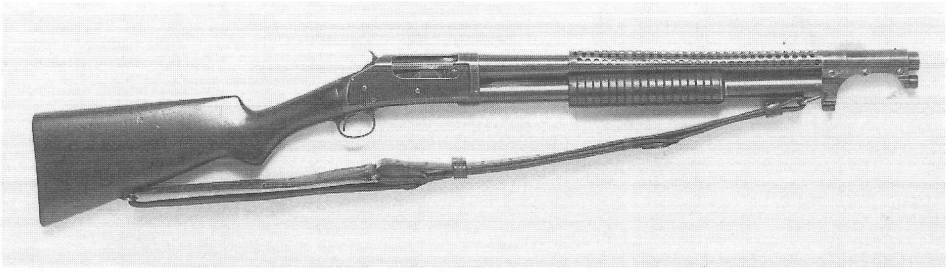
Equipped with a bayonet, the shotgun has now become an American Army weapon

Illustration from May 11, 1918, issue of *Scientific American* showing a Winchester M1897 trench gun with an attached M1917 bayonet in the hands of a Doughboy. (*Scientific American* magazine)

(left) Close-up view of WWI-vintage Winchester handguard/bayonet adapter assembly for M1897 trench gun. Note the sling swivel attached to the bayonet lug and the "PAT APPL FOR" marking.

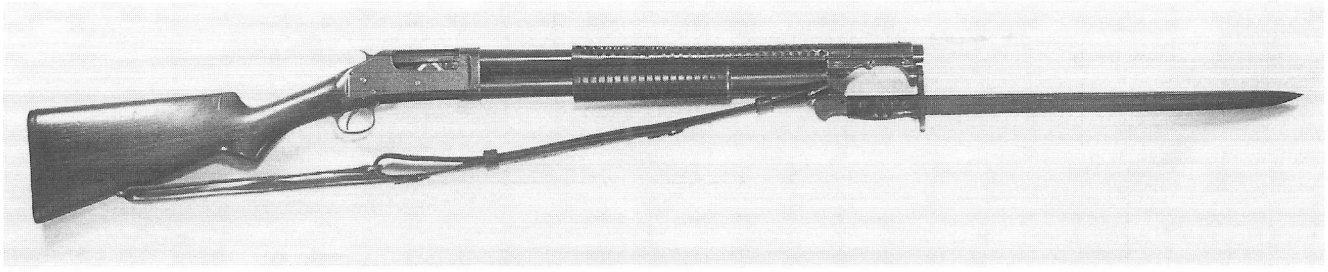
(below) Transverse grooves milled into bottom of M1897 barrel into which the screws fastened to attach the handguard/bayonet adapter. Note the projection on the magazine cap that fitted into a hole in the adapter assembly.



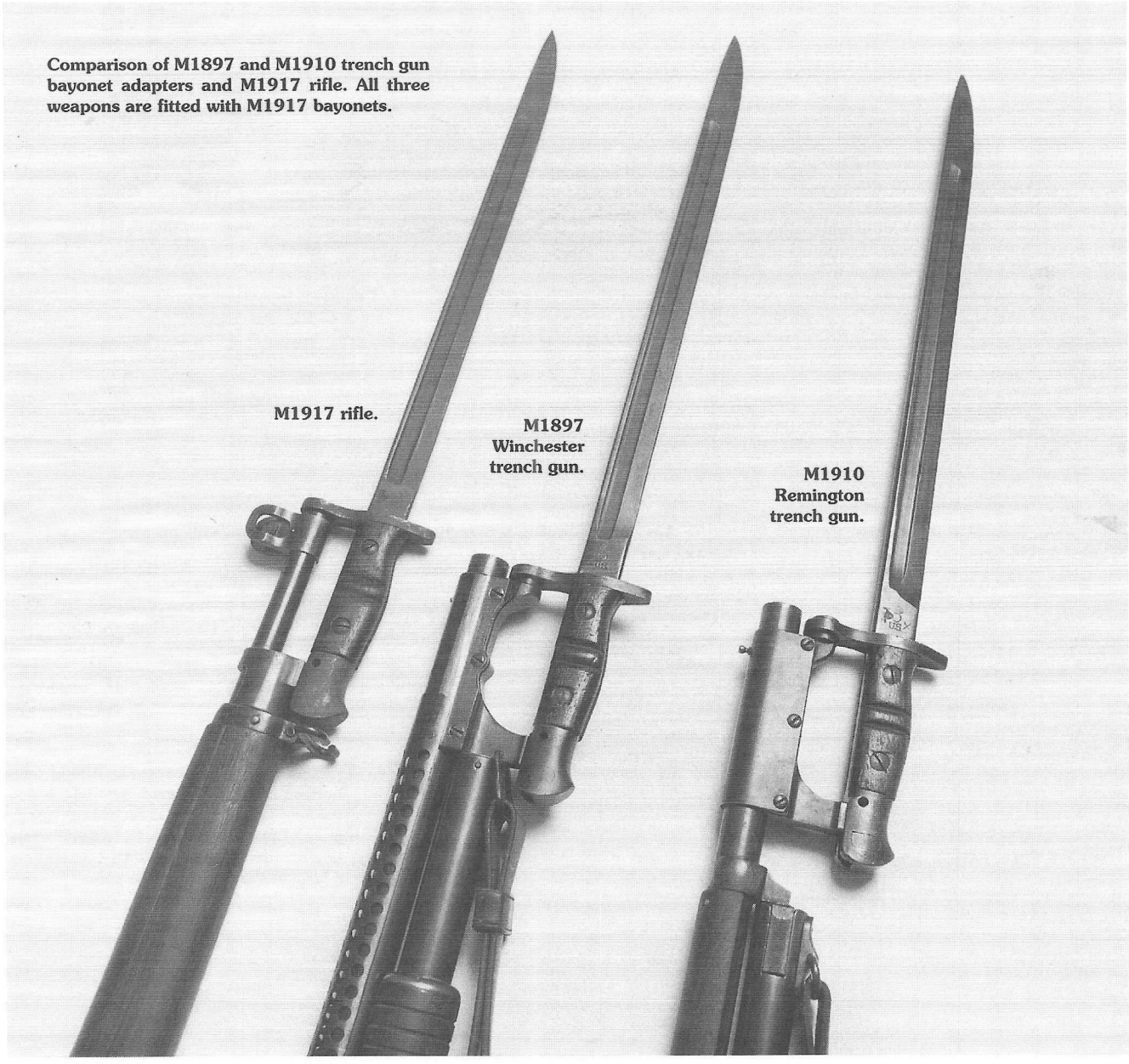


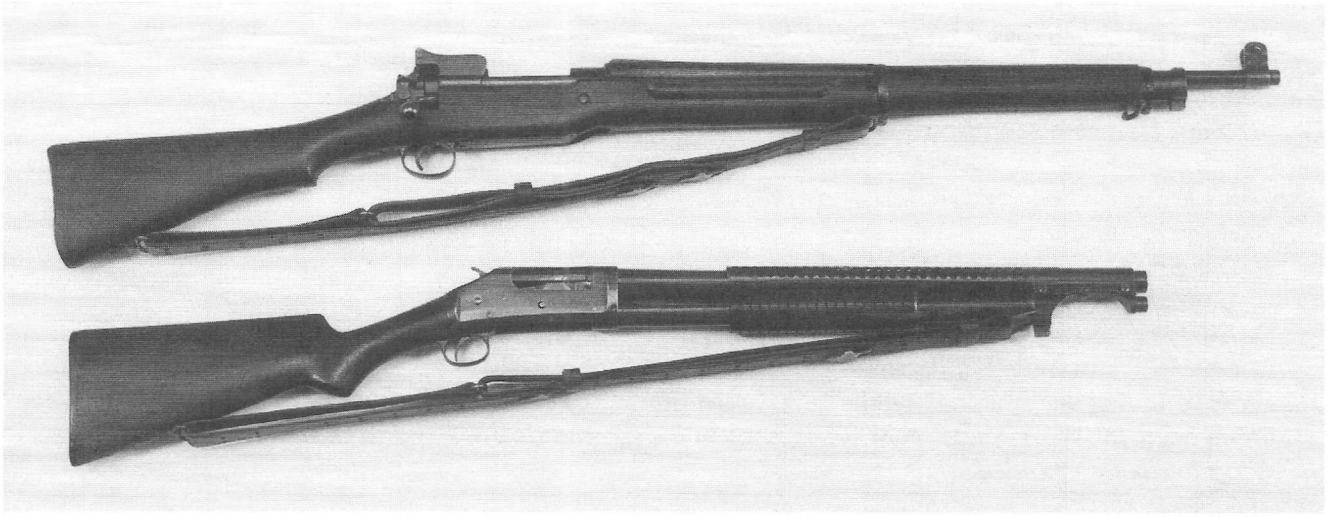
(left) Model 1897 Winchester "Trench Gun" with M1907 leather sling. A total of approximately 25,000 M1897 trench guns were purchased by the government during WWI.

(below) M1897 trench gun fitted with M1917 bayonet.



Comparison of M1897 and M1910 trench gun bayonet adapters and M1917 rifle. All three weapons are fitted with M1917 bayonets.





Comparison of M1917 rifle (top) and M1897 trench gun (bottom). The trench gun's more compact size made it easier to utilize in short-range trench combat.

equipped with the M1917 rifle in order to simplify bayonet supply considerations. From all indications, however, these directives were not always carried out.

The standard M1907 rifle sling was issued with the new trench gun. One sling swivel was attached to the handguard/bayonet adapter assembly and the other swivel was affixed to the butt stock. Standard commercial production paper-cased 00 buckshot was authorized for issue with the trench guns.

Since combat shotguns were new to the Army's Tables of Organization and Equipment (TO&E), it was decided to issue limited numbers to selected infantry units for preliminary field testing and evaluation. An Ordnance Department memo dated June 8, 1918, stated:

...1000 shotguns, referred to herewith, together with ammunition are now available in Depots in France...Instructions are requested regarding the issue and distribution of these weapons. It is suggested that they may prove a most valuable arm for the use of raiding parties, and that a practical test be made in the 26 th and 42 nd Divisions, and that full information be furnished this office within 30 days, showing the difficulties experienced in maintenance, the susceptibility to jam under trench conditions, and the effectiveness of the weapon. Fifty guns should be issued each Division mentioned above, with 100 rounds of ammunition per gun...

Divisions known to have been issued trench guns during the war included the 5th, 26th, 32nd, 35th, 42nd, 77th and 82nd.

The reports from the various infantry units issued trench guns for testing are very interesting and revealing. Several excerpts from the official reports (dated late August of 1918) follow:

From: H.J. Hunt, Colonel, Sixth Infantry, Commanding

It is the general opinion of those who have used the shot guns that they are effective weapons for scouting and patrolling purposes.

From: P.B. Peyton, Major, Sixth Infantry, Commanding

After testing the shotguns which are in use by the Scout Platoon, report that at a range of 100 yards the gun is not effective. At a range of 50 yards the gun has a dispersion of about 8 feet and will disable a man. At close range it is very effective and will kill.

From: John W. Leonard, Major, Sixth Infantry, Commanding 3rd Battalion

They are valuable for use of patrols operating at night due to their short range. We found them to be of greater value for night patrols than for day work.

From: H.P. Blanks, Captain, 61st Infantry

Shot-guns in this regiment have given very satisfactory results. Their effectiveness at short ranges, on raids and on patrols makes them a most desirable weapon, and I would recommend that they be adopted.

From: J.B. Bennet, Colonel, 11th Infantry, Commanding

Twelve Winchester Repeating Shotguns were issued to this regiment for trial. They were equally distributed among the three battalions and assigned to Scout platoons for use. Trial was had in S. Sector, Ban de Sapt by active patrols.

Scout Platoon Commanders report as follows;
A. Burst satisfactory.
B. Dangerous weapon to enemy.
C. Undoubtedly the weapon for short range patrol work.
D. Effect on enemy demoralizing.
E. Efficacious in breaking up small parties or patrols of enemy.
F. No jamming or "sticking" of shells reported. Period of trial was during dry weather. Generally recommended for short range night work, both in attack and defense and in patrolling.
Adoption recommended.

From: C.W. Jones, Captain, 60th Infantry, Commanding

The shotguns of this Battalion have never been used against the enemy. They were carried on most of our patrols. There was a great demand for them by the men of the patrols and were also wanted by the men of the combat Groups. We found the paper shells would not stand frequent reloading, were inconvenient to carry without regular belt. When the cartridges get wet they will not work properly. If the defect of jamming of wet shells and a proper cartridge belt can be supplied the tactical use of the weapon is undoubtedly excellent.

From: John T. Brandt, 2nd Lieut., 60th Infantry, 1st Bn. Int. Officer.

The shotguns of this Battalion have not been used in action so that no report can be made as to their effects.

The shells become battered and spoiled by handling, loading and unloading and getting wet so that they jam in the gun when loading. No belts have been furnished for the shells and no suitable way for carrying them. If a good belt was furnished for carrying, the above mentioned trouble of deformed and battered shells would be diminished.

From: Frank B. Hawkins, Colonel 60th Infantry.

It is firmly believed that the shot guns are very effective weapons for use in close range fighting. In the last sector occupied by this Regiment I am informed that there was no opportunity for the use of these weapons other than...in two patrols engagements with the enemy at close quarters... these weapons were used and both times casualties were inflicted on the enemy by their use.

One drawback has been that the ammunition in many cases becomes swollen from dampness thus causing jamming. Even with great care the shells are likely to become more or less wet when carried by the men who had to crawl through wet grass or remain for some time in the rain. It is recommended that the cases for shells be made of brass.

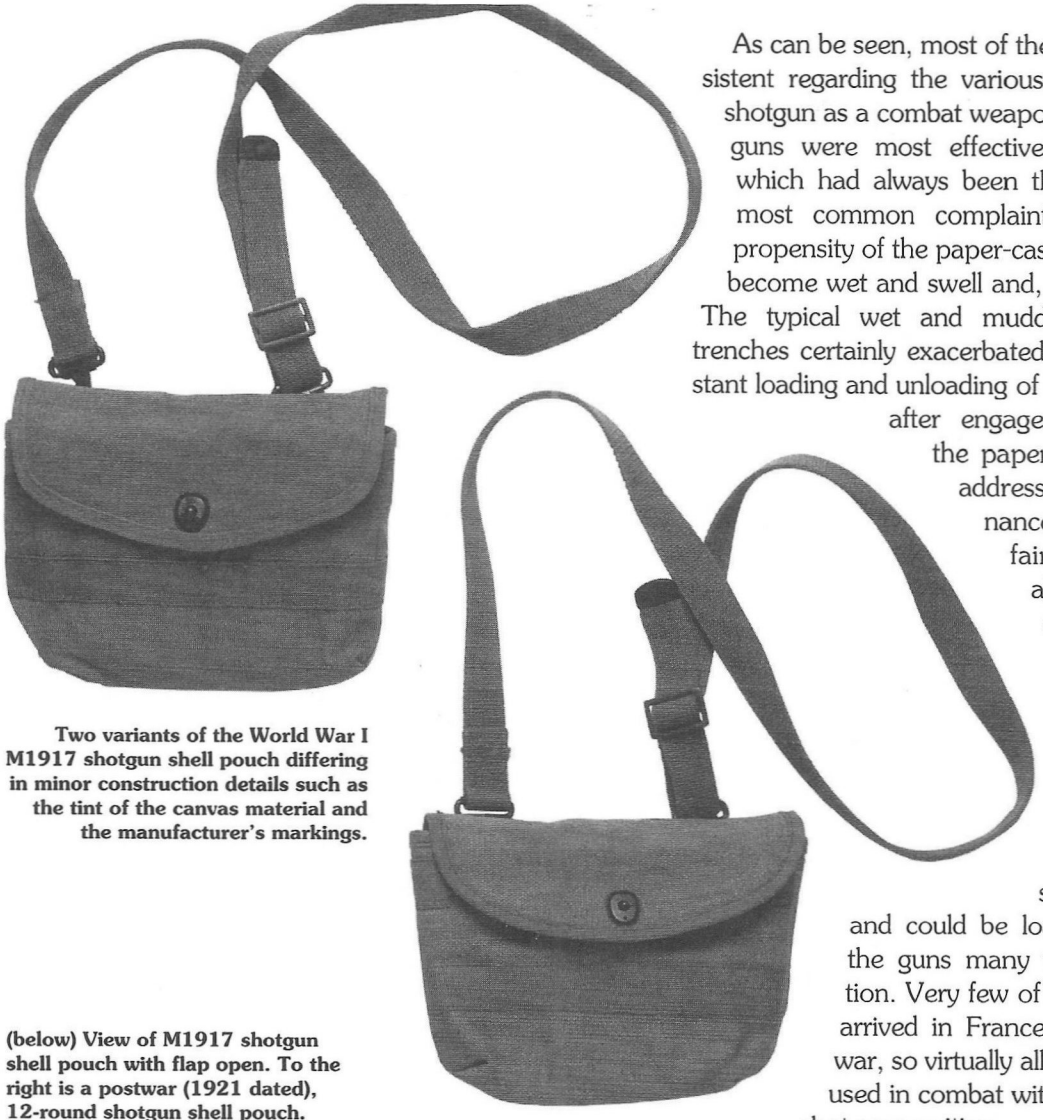
From: F.H. Fowler, 32nd Division, M.G. Officer

This report is based on a personal conversation with each of the lieutenants who had charge of the scouts in the 127th and 128th Regiments, to whom the twelve riot guns per regiment were issued.

The guns were used but little in the 127th. They has (sic) but little ammunition and no bayonets. Men did not like them, prefering (sic) a rifle. The gun is not adapted to open warfare in open country in which we are now engaged. Would be useful in close fighting in close country. The cartridges frequently get crimped and will not work freely. A special carrier should be furnished. Five guns out of the twelve in the Regiment were lost.

In the 128th Regiment all twelve men having those guns were killed or wounded. The gun is not adapted to open warfare. Guns had bayonets but the range is not great enough for open warfare. The men much prefer the rifle. The gun is a fine weapon and might be useful for close fighting.

Do not care for any more of them at present.



Two variants of the World War I M1917 shotgun shell pouch differing in minor construction details such as the tint of the canvas material and the manufacturer's markings.

(below) View of M1917 shotgun shell pouch with flap open. To the right is a postwar (1921 dated), 12-round shotgun shell pouch.

As can be seen, most of the reports were quite consistent regarding the various units' appraisal of the shotgun as a combat weapon. It is apparent that the guns were most effective for close-range work, which had always been the weapon's forte. The most common complaint centered around the propensity of the paper-cased 00 buckshot shells to become wet and swell and, thus, become unusable. The typical wet and muddy environment of the trenches certainly exacerbated the problem. The constant loading and unloading of the weapons before and after engagements further battered the paper-cased ammunition. To address this problem, the Ordnance Department ordered a fairly large quantity of all-brass 00 buckshot ammunition for issue with the trench guns. While much more expensive than the standard paper-cased ammunition, the brass shells were not susceptible to swelling from moisture and could be loaded and reloaded into the guns many times without deformation. Very few of the brass shotgun shells arrived in France before the end of the war, so virtually all of the trench guns were used in combat with the paper-cased buckshot ammunition.

A number of the test reports also contained some complaints regarding the lack of a suitable means of carrying extra shotgun shells. This was mentioned in a post-WWI article published in the *American Rifleman*:

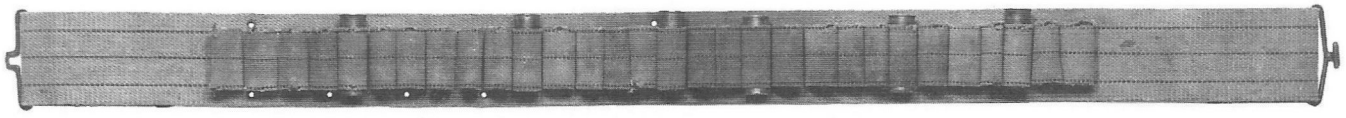
> *...The ammunition for these guns (shotguns) was put in the usual cartons of 25 shells each, packed in sealed tin containers of 20 cartons, 500 shells, in the usual wooden Army shipment boxes. In the trenches the cartons were set on the long shelf under the parapet, with Mills bombs and percussion and rifle grenades, and the doughboys would put a couple of handfuls in their breeches pockets, just as they were accustomed to "at home on the farm."*

While some canvas belts with loops are believed to have been procured, this was not the best way to carry shotgun ammunition while traversing wet trenches or crawling through muddy shell holes.

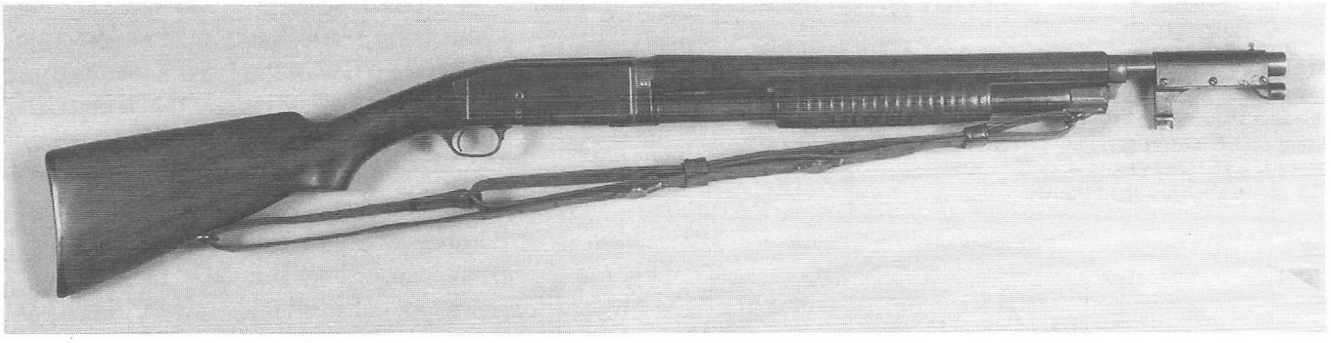
Canvas pouches with internal loops holding 32 shotgun shells were put into production for issue with the trench shotgun shells. The ammunition was protected in the pouches that had covers secured by a "lift-the-dot" fastener. The pouches were fitted with web slings for carrying purposes. Such pouches are marked inside the cover flap with the year of production ("1918" for all examples noted) and the name and/or logo of the manufacturer. Due to the heavy weight of thirty-two 00 buckshot shells, canvas reinforcement strips were sewn to the outside to further strengthen the pouch.

Government records indicate that Winchester manufactured some 19,196 Model 1897 trench guns during WWI. It is probable that several thousand more were subsequently acquired, and as many as 25,000 (total) may have been ultimately procured by, or just after, the Armistice.

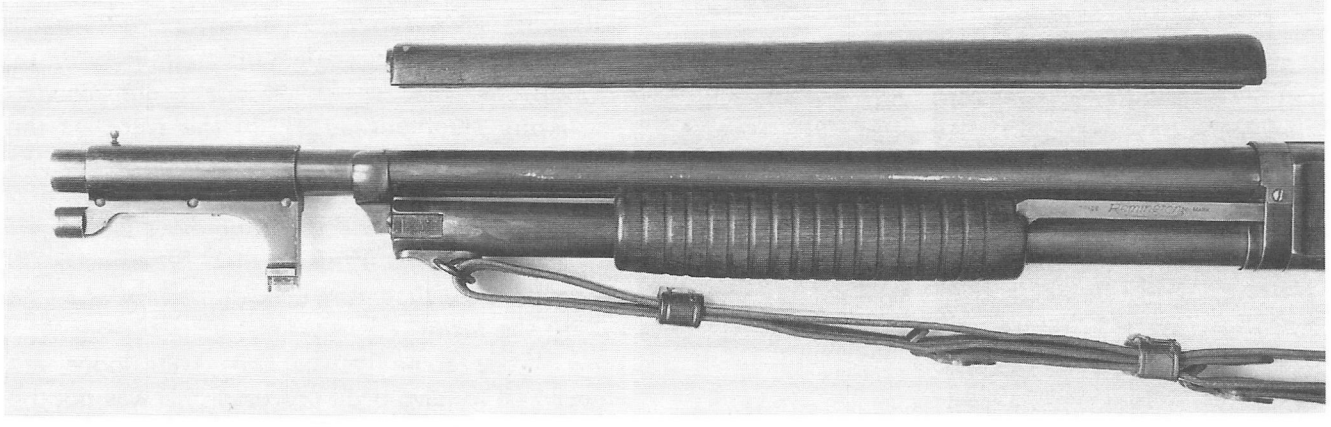
In order to put as many trench guns into the hands of our troops as possible, the Ordnance Department contracted with Remington Arms Company to manufacture a modified version of its Model 10 repeating slide-action "riot" shotgun capable of mounting a bayonet and fitted with sling swivels. The Remington Model 10 "trench gun" differed from the Winchester M97 in several respects. The M10 was a hammerless design which featured a closed action that loaded and ejected shells through a single opening in the bottom of the receiver. Rather than utilize the stamped sheet-metal handguard/bayonet adapter developed by Winchester and Springfield Armory, Remington chose to use a metal bayonet adapter that attached to the end of the barrel and a separate wooden handguard that clamped on top of the barrel. The government purchased 3,500 Remington Model 10 trench guns (along with 1,150 plain-barrel M10 riot guns) during World



Early Mills shotgun belt. Although official documentation is lacking, it is believed that some of these belts were acquired by the U.S. military for issue with trench guns and riot guns. Belts of this type would not have been the optimum manner in which to carry paper-cased shotgun shells in the wet and muddy environment of the trenches.



Remington Model 10 WWI trench gun with M1907 leather sling. A total of 3,500 Model 10 trench guns were delivered to the government during World War I.

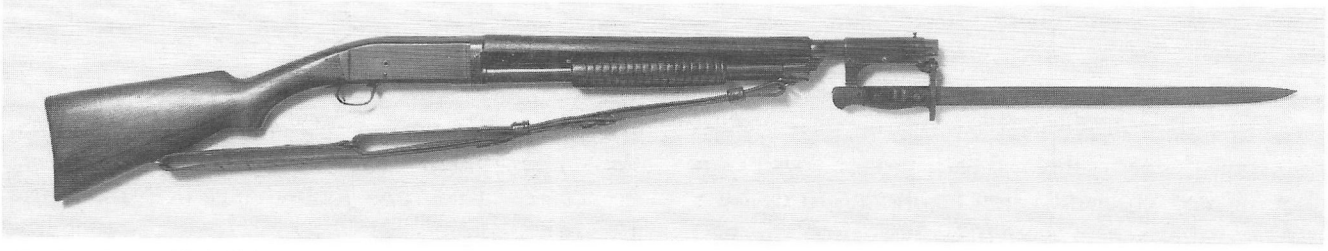


Wooden handguard removed from Remington Model 10 trench gun. Note how this component, and the separate metal bayonet adapter fastened to the barrel, differ from the one-piece Winchester assembly used on the M1897 trench gun.

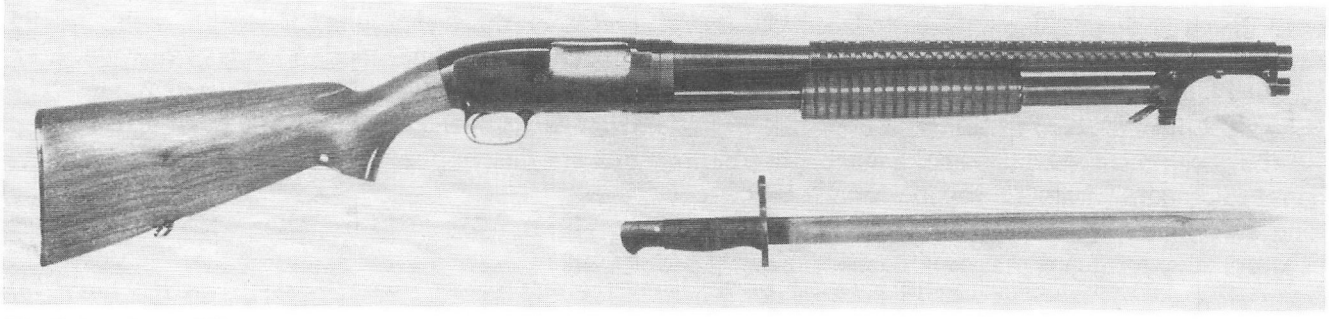
War I. As can be seen, the number of Remington Model 10 trench guns acquired was far fewer than the number of Winchester Model 97 trench guns.

Winchester also developed a trench gun version of its Model 12 slide-action shotgun fitted with the same type of ventilated metal handguard/bayonet adapter assembly as used with the Model 97. Very few, if any, Model 12 trench guns were actually produced and issued during WWI, although large numbers were made during the Second World War. Remington developed at least one prototype "trench gun" based on its autoloading Model 11 shotgun. However, the

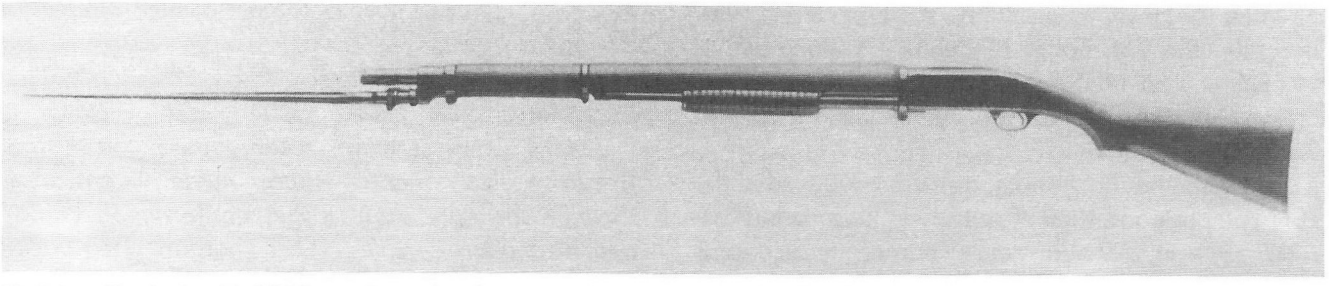
First World War vintage Remington Model 10 riot gun. During WWI, the government procured from Remington only about 1,500 M10 riot guns. Unlike the M10 trench gun, original M10 riot guns were not fitted with handguards, bayonet adapters or sling swivels. After the war, some M10 trench guns were modified to riot gun configuration, and these will have sling swivels.



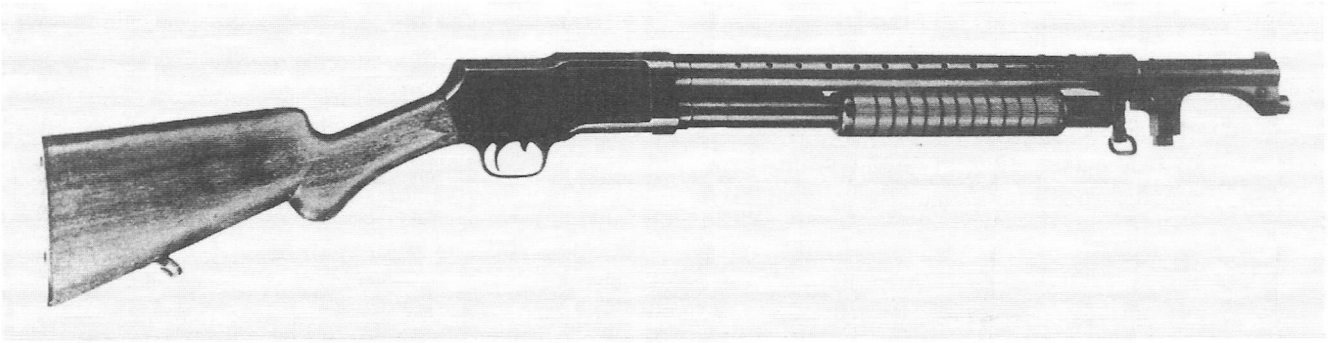
WWI Remington Model 10 trench gun with M1917 bayonet.



Winchester photo of WWI-era Model 12 trench gun and M1917 bayonet. This variant was fitted with the same type of ventilated metal hand guard/bayonet adapter as used on the M1897 trench gun. It is not known if any Model 12 trench guns were actually fielded during the war. (Winchester Repeating Arms Company)

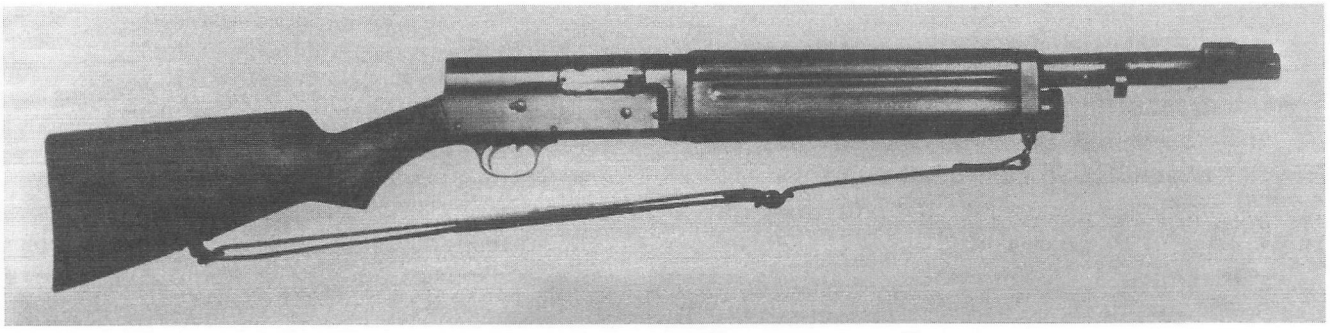


Prototype Remington Model 10 trench gun fitted with an adapter for the M1891 Russian Mosin-Nagant bayonet. It is not believed that any such weapons were actually delivered to the Russians during the war. (National Archives)



(above) Prototype Stevens Arms Company Model 520 WWI trench gun. No weapons of this type were manufactured during World War I. (Photo Credit: *The World's Fighting Shotguns*)

(below) WWI-vintage prototype of Remington Model 11 autoloading "trench gun." The sliding barrel of this arm required a steel jacket in order to mount a bayonet adapter. This weapon did not see production. (Photo Credit: *The World's Fighting Shotguns*)



recoil-operated mechanism of the weapon, which necessitated a barrel that slid back and forth with each shot, created problems when attempting to devise a means to attach a bayonet. The problem was addressed by fitting the barrel inside a solid metal sleeve. It is not believed that any guns of this type, other than a single prototype, were produced. Stevens Arms Company also produced at least one trench gun variant prototype of its slide-action Model 520, but none were manufactured or issued.

The government also purchased a number of plain-barrel "riot guns" (without bayonet attachments or sling swivels) during WWI. These were presumably used primarily for guard purposes stateside, although some were sent to France as well. Plain-barrel riot gun versions of the Winchester Model 97, Winchester Model 12, Remington Model 10 and Remington Model 11 (autoloading) are known to have been procured by the government during the First World War. However, the Winchester Model 1897s along with a few Remington Model 10s were the only shotguns ("trench guns") known to have been issued for combat during World War I.

As more and more shotguns were employed in the front-line positions, their effectiveness became increasingly apparent. There were numerous accounts regarding how efficient the shotgun could be in certain close-quarter combat applications during the war. As related in an *American Rifleman* article, one U.S. Army infantry officer stated:

...his men had one good chance with them at a German mass assault upon his trench — a charge obviously intended to overwhelm the defenders with its solid rush of men. (They) let them come on; and when those shotguns got going — with nine .34 caliber buckshot per load, 6 loads in the gun, 200-odd men firing, plenty more shells at hand — the front ranks of the assault simply piled up on top of one another in one awful heap of buckshot-drilled men.

The London Field magazine wrote on the same subject:

A number of these (shot)guns in the hands of cool men in a tight place, each spraying approximately 450 slugs a minute, develops a combination against which the familiar German mass attack is exceedingly apt to fade in the act of blooming, and become a retreat.

Laurence Stallings also related the following in *The Doughboys*:

...(a) Chicago sergeant, undergoing much hostile fire to reach a concrete pillbox, made his entrance through the stage door of the pestiferous machine-gun nest bearing a sawed-off shotgun. Two buck-shot blasts and the twenty-three performers left on their feet surrendered.

The effectiveness of the American "trench gun" did not go unnoticed by our German adversaries. The German government reacted swiftly and vigorously to the use of shotguns by the Doughboys. On September 14, 1918, the German government lodged an official diplomatic protest against the American's use of shotguns in combat and sent the following cablegram to Secretary of State Lansing which read, in part:

The German Government protests against the use of shotguns by the American Army and calls attention to the fact that, according to the laws of war, every prisoner found to have in his possession such guns or ammunition belonging thereto forfeits his life.

The Germans were referring to a passage in the Hague Decrees (forerunner of the Geneva Convention) that stated: "It is especially forbidden to employ arms, projections or materials calculated to cause unnecessary suffering." In addition to this official protest, many German newspapers editorialized on the issue. *The Cologne Gazette* decried "American barbarism" and predicted that "...tommy-hawks and scalping knives would soon make their appearance on the American front" and further stated that Americans are "...not honorable warriors"! *The Weser Zeitung* opined that "...the barbarous shotguns have been served out not because they are likely to be effective but because the ill-trained Americans cannot use rifles and are badly supplied with machine guns." It is reported that some Doughboys were amused by these editorial rantings.

The American response to the German threat to execute Doughboys simply for possessing shotguns or shotgun ammunition was swift and to the point. Secretary of State Lansing coolly replied that the use of shotguns by American troops was most assuredly *not* prohibited by the Hague Decrees, and if the Germans carried out their threats in even a "...single instance," the American government knew what to do in the way of reprisals and stated that "... notice is hereby given of the intention to make such reprisals..." As stated in a subsequent *American Rifleman* article on the subject:

Uncle Sam did not intend to have his trench-shotgunners massacred simply because he had given them a weapon which even the pick of the Prussian "shock troops" dreaded more than anything that four years of war had called on them to face.

Whether or not the oft-repeated comment that the Germans feared the shotgun more than any other weapon they encountered is accurate, the strong reaction of their government certainly lends credence to this assertion. Apparently, the American response served the desired purpose, as there is no evidence that the Germans executed any Doughboys because they were captured with shotguns or shotgun shells in their possession.

It is astounding that the Germans, who regularly employed machine guns, flame throwers and poison gas, would be so upset about the use of shotguns. It is entirely likely that the Germans feared the American behind the shotgun as much as he feared the weapon itself. In any event, the United States continued to issue shotguns in ever-increasing numbers until the Armistice. As stated in one article following the war:

The shotguns went right on at their business — so terrible a success that message after message from G.H.Q. to America begged: "Give us more shotguns!"

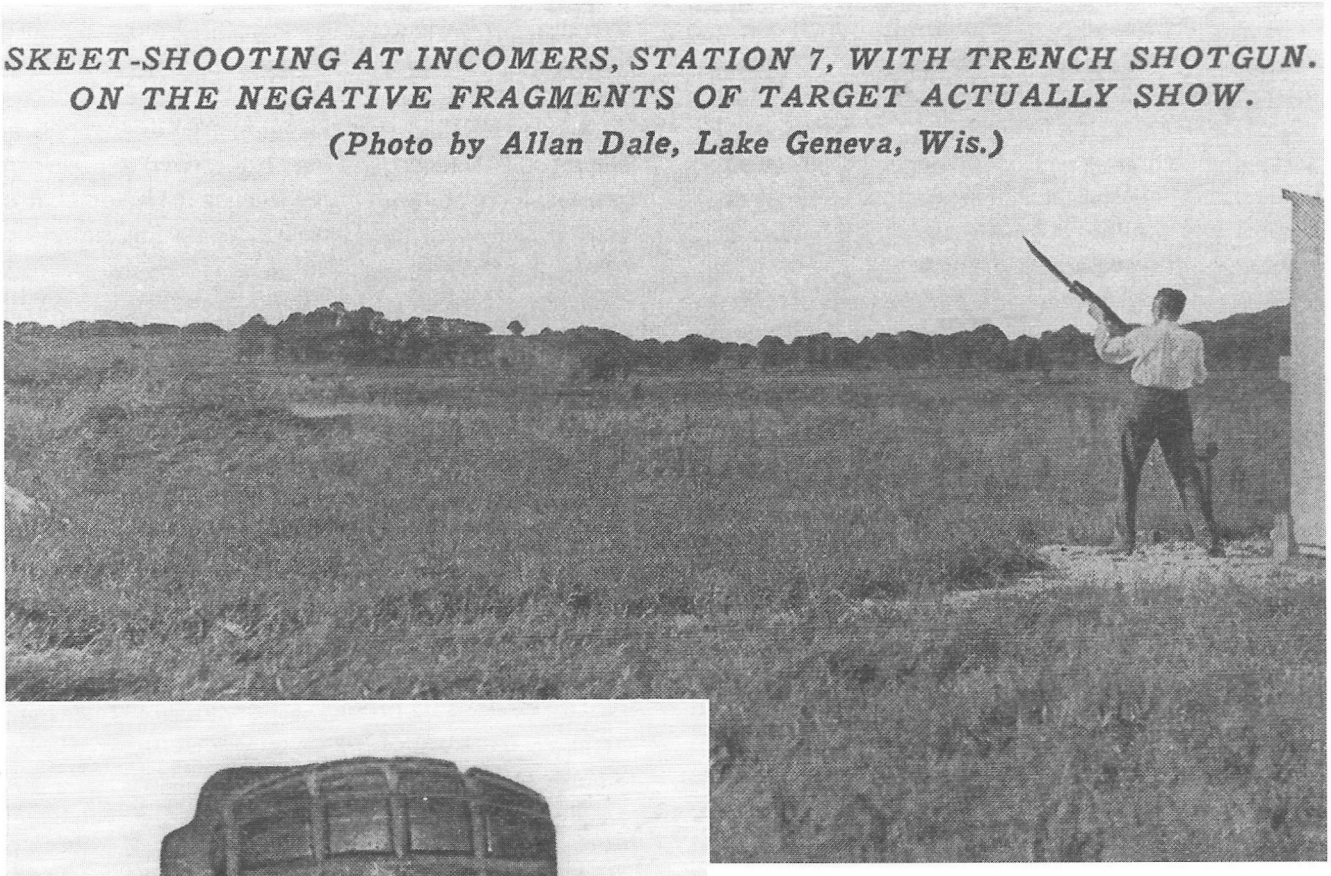
Other than the problems encountered with the paper-cased shells, the trench guns served the Doughboys well. The fact that they apparently scared the hell out of the Germans was an unexpected but not unwelcomed benefit.

Some trench guns were also employed in front-line trench positions to protect against incoming German grenades. This use of trench guns was discussed in a postwar article in the *American Rifleman*:

An interesting if amazing purpose which these guns were supposed to serve was that of shooting from the trenches, a la trapshooting, at hand-grenades, "potato-mashers", and the like thrown over by the enemy, with a view to knocking such missiles back, to fall and explode outside the parapet. The procedure was taught and practiced at training-camps during the war, using dummy Mills bombs as the aerial targets. We procured a number that had actually been used and shot at in 1918, and took them out to our skeet field and tried the game with the gun and buckshot, bayonet on. We found the bombs could not only be hit, but we shattered one of those cast-iron dummies in the air, with buckshot.

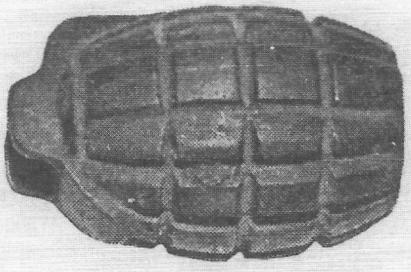
In addition to the short-barrel trench guns and riot guns, a number of longer barrel shotguns were acquired by the government for trapshooting in order to teach the fundamentals of "leading a target" to aerial gunners. Winchester Model 97 and Model 12 along with some Remington Model 10 training guns were procured for this purpose during the war. It has been reported, but not positively confirmed, that some of the longer barrel shotguns were used to down enemy carrier pigeons.

The trench guns and riot guns remained in Uncle Sam's arsenal following the Armistice, and many saw action in the hands of soldiers and marines stateside and in several foreign "hot spots" during the 1920s and 1930s.



SKEET-SHOOTING AT INCOMERS, STATION 7, WITH TRENCH SHOTGUN. ON THE NEGATIVE FRAGMENTS OF TARGET ACTUALLY SHOW.
(Photo by Allan Dale, Lake Geneva, Wis.)

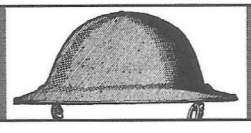
(above) Photo from 1935 *American Rifleman* showing a demonstration of "skeet shooting" dummy Mills bombs hand grenades. This was done to determine the ability of the trench gun to shatter incoming enemy grenades as was reportedly done during the First World War.
(*American Rifleman* magazine)



DUMMY MILLS BOMB, WHICH WAS LATER SHATTERED IN THE AIR BY BUCKSHOT CHARGE FROM THE GUN
(Photo courtesy Milwaukee Public Museum)

(left) Illustration from the above-referenced *American Rifleman* article depicting a dummy cast-iron Mills bomb (hand grenade) used for training purposes.
(*American Rifleman* magazine)

Collector Notes



U.S. military shotguns have become enormously popular with collectors over the past five or six years. Prior to this time, the scarcity and desirability of these weapons went largely unrecognized by collectors, and prices were undervalued. The situation has now reversed and collector-quality military shotguns are highly prized with price tags to match.

First World War vintage military shotguns are harder to find than their World War II counterparts. This is due to the fact that fewer were made and they were in use a quarter of a century longer than the 1941–1945 shotguns. As is the case with virtually all U.S. military weapons, many shotguns have been overhauled one or more times during the time they were in the government's inventory.

Winchester Model 1897 Trench Guns and Riot Guns

The most commonly encountered WWI military shotgun today is the Winchester Model 1897 trench gun and riot gun. Assuming comparable condition and originality, the trench guns are more desirable (and expensive) than the riot guns. Since many of these guns were overhauled after the war and since some have recently been subjected to questionable "restoration" practices, it is important to examine certain key features when attempting to determine the originality of a particular specimen. The following characteristics will be found on original, unaltered WWI-vintage Winchester M97 trench guns:

(1) Serial numbers in three distinct blocks:

E433144–E474130
E514382–E566857
E613303–E697066

By far, the largest number of WWI M97 trenches guns will fall into the third block of numbers (E613303–E697066). It should be noted that these serial number blocks are based on observed original specimens, and serial numbers on both sides of the high and low numbers could well be encountered. However, the variance shouldn't be extremely great. It should also be mentioned that many of the lists that have been published showing the manufacturing dates based on serial numbers for Winchester guns are quite inaccurate. For example, the third block of numbers listed above were made in 1918 but are shown as being early 1920s production in many of these lists.

(2) Blued finish. Many were parkerized when subsequently overhauled but the original finish was Winchester's attractive rust blue. Some guns have been commercially reblued and such guns will often evidence indistinct markings and a glossy, hot blue-type finish. Any parkerized gun has been refinished.

(3) Black hard rubber (plastic) buttplates with an embossed Winchester logo. A number of guns that were later overhauled had other types of buttplates installed, including cast-metal checkered plates, to replace damaged originals.

(4) The ventilated metal handguard should have six rows of holes, and the overall condition should match the rest of the gun. The adapter should be marked either "PAT APPL FOR" on the right side of the bayonet lug or "1918" on the left side of the barrel sleeve portion of the assembly. Handguard/adapter assemblies that are unmarked are incorrect for WWI-vintage guns. Adapters marked "W" and having four rows of holes rather than six are Second World War vintage units and are also incorrect for WWI trench guns. All WWI and WWII assemblies were adapted for the M1917 Enfield rifle bayonet. Some handguard/bayonet adapter assemblies were removed and discarded by subsequent owners, and original examples are highly sought after today for restoration purposes. Unfortunately, they are rarely found. A trench gun missing the original handguard/adapter assembly or fitted with an incorrect replacement is seriously devalued for collecting purposes

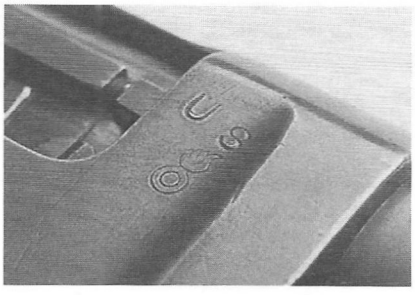
(5) The stock should be of the correct vintage and characterized by a thin wrist and high comb. Many original stocks were broken, and later pattern replacements were installed. The WWI stocks were not cartouched.

(6) All other features should be consistent with Winchester M97 shotguns of 1917–1918 vintage.

(7) The barrels will be marked "CYL" to indicate cylinder bore.

(8) The stock will be fitted with a sling swivel, and a swivel will be attached to the bayonet adapter assembly. A black rubber buttplate having the Winchester name and logo will be present. Some guns were fitted with unmarked cast-metal buttplates (inletted slightly at the top of the comb) during overhaul.

Some of original WWI-vintage M1897 trench guns were stamped with "US" and a "flaming bomb" insignia on the right side of the receiver in front of the ejection port. The markings were obviously hand-stamped, as they are not



Close-up view of hand-stamped "US" and "flaming bomb" ordnance markings found on U.S-issue M1897 trench guns.

well aligned. The markings appear virtually identical to those found on the US-surcharged Winchester M1894 .30-30 carbines. Other M1897 trench guns known to have been purchased by the government during WWI were not martially marked. These markings are the subject of some disagreement among collectors and students of the subject today. While other theories may be presented, the most credible explanation is that the guns actually issued to the troops were stamped with these martial markings. The war ended before many of the guns could be issued and they remained in storage and were not stamped with the "US" and "flaming bomb." Again, this is simply a theory, and other explanations are indeed possible.

The Winchester M1897 riot guns will have features generally consistent with the trench guns except for the lack of a handguard/bayonet adapter and sling swivels. Martial markings may vary from those found on the trench guns. Some original WWI riot guns had smaller "US" and "flaming bomb" markings (apparently machine stamped) on the left side of the receiver along with a small "flaming bomb" insignia on the top of the barrel and another close to the serial number on the receiver. These markings are not found on original WWI trench guns.

As stated, given comparable condition and degree of originality, trench guns will usually bring substantially more on the market than the plain-barrel riot guns. Any original specimen is a great martial collectible that is sure to continue to appreciate in value.

Winchester Model 12
Trench Gun and Riot Gun

It is not known if any Winchester Model 12 trench guns were ever actually manufactured and issued to troops for combat purposes during WWI. No original examples have been observed, and the only specimens pictured are in Winchester archival photos. Based on an examination of government records, serial numbers would likely fall (roughly) in the 162340–190507 range. The same type of handguard/bayonet adapter assembly as found on the Winchester M97 trench gun would almost certainly be proper.

A few 1916–1918-vintage military issue Winchester Model 12 plain-barrel riot guns have been observed. These fall into the same serial number range indicated above. Martial markings vary but most consist of a "US" and "flaming bomb" stamped on the metal. At least one has been seen with a "JSA" cartouche stamped on the stock. The stocks should be early vintage with thin wrists.

Second World War issue Model 12s are quite common, but any original example of a WWI military issue Model 12 shotgun is a rare find and a highly desirable collectible.

Remington Model 10
Trench Gun and Riot Guns

The only trench gun other than the Model 1897 known to have been manufactured and issued for combat purposes during WWI was the Remington Model 10. The Winchester Model 97 and Remington Model 10 are illustrated in WWI-era ordnance publications. The following characteristics will be found on WWI-vintage Remington Model 10 trench guns:

(1) A 23" barrel rather than the 20" barrel found on the Winchester trench guns. The barrel was stamped with the serial number of the gun, and matching numbers are more valuable than mismatched barrel/receiver combinations. Some trench guns were later cut-down to riot length (20" barrels).

(2) A separate wooden handguard

was fastened to the top of the barrel and a metal bayonet adapter clamped to the end. The adapters were normally stamped with an "eagle head" proof mark on the end of the bayonet stud. A number of these guns had the handguards and/or bayonet adapters removed after the war. Such guns that are missing these components today are seriously devalued. Some reproduction handguards that differ in some minor respects from the originals were made a few years ago, but these are not commonly encountered. Any wooden handguard appearing too new for the rest of the gun should be looked at very closely.

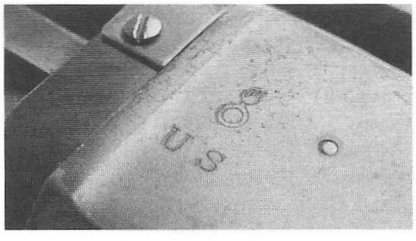
(3) All external metal parts should be blued.

(4) Sling swivels were fitted.

(5) The buttplate should be hard rubber (plastic) with the Remington name.

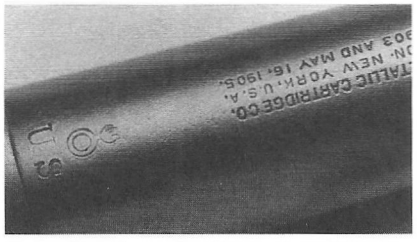
(6) All originals observed are stamped with a "US" and "flaming bomb" on the left side of the receiver.

(7) Stocks are not cartouched.



"US" and "flaming bomb" markings on WWI Remington Model 10 trench gun.

The original WWI Remington Model 10 riot guns will have most of these features except they will not have handguards, bayonet adapters or sling swivels and will usually have 20" barrels. The location of martial markings of the original riot guns will vary somewhat from the trench guns. The trench guns altered to riot gun configuration (shortened barrels and handguard/adapters removed) will have sling swivels. The value for original riot guns and modified trench guns seems to be about the same, although the former are more rare.



Martial markings on WWI Model 10 riot gun. Original M10 riot guns were so marked on the top of the barrel rather than on the side of the receiver, as found on M10 trench guns.

Any original WWI Remington Model 10 military shotgun, especially a trench gun with the wooden handguard, is very hard to find today. The Model 10 trench gun is among the rarest U.S. military shotguns of any era, and original examples can bring surprising prices on today's market.

M11 Riot Gun and Prototype Shotguns

No known original First World War vintage U.S.-issue Remington Model 11 riot shotguns have been observed and an example would be a fantastic find. The Model 11 trench gun and Stevens M520 trench gun prototypes are essentially one-of-a-kind items and it is very doubtful any specimens will be encountered.

Accessories

The 32-round shotgun shell pouches are still around today, but prices are rising quite rapidly. Some are missing their shoulder straps which reduces the value quite a bit. Nice examples are avidly sought by collectors today. Web shell belts are also interesting collectibles, but very few details regarding their procurement by the military are known. WWI-vintage 00 buckshot, paper-cased or brass, in the original packaging is quite rare. Loose brass shells are commonly found but cannot be distinguished as military issue or even WWI-vintage since they lack any distinguishing markings. However, brass and paper-cased 00 buckshot shells (of the proper vintage) are good additions to a collection.

The correct sling for display with WWI trench guns is the M1907 leather sling with brass hardware. Many slings of this type were marked with the identity of the maker and the year of production. "1918" dates are the most commonly encountered today. Some fakes are on the market so be aware of any sling that appears too new or which differs from the original type, primarily in the method of riveting the metal adjustment "claws."

U.S. military shotguns and accessories are certain to continue to enjoy high collector interest and consistent, or rising, prices. While a nice example may seem too high in price today, it will likely appear to be a bargain five years from now.

Automatic Rifles

Although machine guns were developed prior to the First World War, they were used sparingly, and it was not until the 1914–1918 conflict that they became extremely important tools of warfare. Infantry tactics used in the 18th and 19th centuries proved to be literally suicidal when employed against modern automatic weapons during WWI. No infantry weapon did more than the machine gun and automatic rifle to alter infantry tactics and battlefield deployment. World War I changed the machine gun from a seldom-used novelty into a standard infantry weapon.

We will discuss several types of automatic weapons, including automatic rifles and machine guns. There will necessarily be some overlap between the categories of automatic rifles, light machine guns and heavy machine guns. For the sake of this discussion, automatic weapons will be categorized as either automatic rifles or machine guns even though the lines between the two categories may be blurred by some weapons that follow. All nations engaged in the war fielded automatic weapons in quantity, and the arms inflicted many casualties. A thorough discussion of automatic weapons is vital to properly present a complete picture of the U.S. infantry weapons of the First World War.

The typical machine gun of the 1914–1918 period was a heavy and cumbersome weapon that could easily weigh in excess of 100 pounds with tripod and other equipment. While this was not a problem when employed in fixed defensive positions, such guns were obviously not easy to transport when troops were moving to the assault. Since large-scale infantry actions as well as smaller scale "trench raids" were quite common during the First World War, the need soon arose for a weapon with the rapid-fire capability of a traditional machine gun but which could be carried and utilized in much the same manner as a rifle. At the beginning of the war, none of the belligerents had a satisfactory weapon of this type in their inventories.

The Madsen "Machine Rifle"

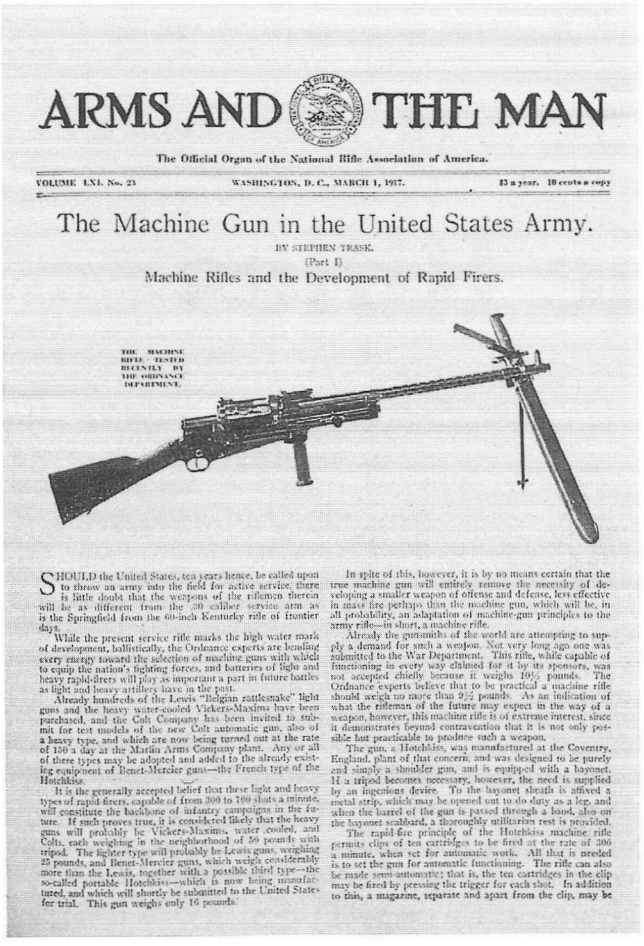
In 1903, the United States Army tested a "machine rifle" developed by the Danish firm of Madsen. The testing was done at Springfield Armory, and the weapon was ultimately deemed "unacceptable." In 1913, a refined model of the Madsen was again tested by the U.S. Army. This design was found to be satisfactory but little official interest was shown in the weapon since the United States had adopted the M1909 Benét-Mercie (to be discussed in the next chapter) a few years earlier. The Madsen and Benét-Mercie weapons essentially filled the same niche, and there was no perceived need for the former weapon. Although the United States declined to adopt the Madsen, it was purchased as a supplementary weapon by several nations including Russia and England. Like the M1909 Benét-Mercie, the Madsen was not a true automatic rifle but somewhat of a hybrid between such a weapon and the "traditional" machine gun.

Hotchkiss Automatic Rifle

The United States briefly considered adoption of the Hotchkiss, an automatic rifle based on a French design. The Hotchkiss automatic rifle was chambered for the U.S. .30 caliber cartridge and was viewed as a "back-up" weapon in case the Browning Automatic Rifle, then under development, did not prove to be satisfactory. Two prototypes were sent to Springfield Armory in 1917 for testing. Although the Hotchkiss automatic rifle was a satisfactory design, the BAR proved to be an unqualified success, and there was no requirement for the Hotchkiss automatic rifle. Further development of the U.S. Hotchkiss automatic rifle project was dropped in January of 1918. None of the weapons were produced, except for a few prototypes.

The Berthier Automatic Rifle

An automatic rifle designed by a Frenchman, the



ARMS AND THE MAN

The Official Organ of the National Rifle Association of America.

VOLUME LXI. No. 23 WASHINGTON, D. C., MARCH 1, 1917. $3 a year. 10 cents a copy

The Machine Gun in the United States Army.

BY STEPHEN TRASK.

(Part I)

Machine Rifles and the Development of Rapid Firers.

THE MACHINE RIFLE TESTED RECENTLY BY THE ORDNANCE DEPARTMENT.

SHOULD the United States, ten years hence, be called upon to throw an army into the field for active service, there is little doubt that the weapons of the riflemen therein will be as different from the .30 caliber service arm as is the Springfield from the 60-inch Kentucky rifle of frontier days.

While the present service rifle marks the high water mark of development, ballistically, the Ordnance experts are bending every energy toward the selection of machine guns with which to equip the nation's fighting forces, and batteries of light and heavy rapid-firers will play as important a part in future battles as light and heavy artillery have in the past.

Already hundreds of the Lewis "Belgian rattlesnake" light guns and the heavy water-cooled Vickers-Maxims have been purchased, and the Colt Company has been invited to submit for test models of the new Colt automatic gun, also of a heavy type, and which are now being turned out at the rate of 100 a day at the Martin Arms Company plant. Any or all of these types may be adopted and added to the already existing equipment of Benet-Mercier guns—the French type of the Hotchkiss.

It is the generally accepted belief that these light and heavy types of rapid-firers, capable of from 300 to 700 shots a minute, will constitute the backbone of infantry campaigns in the future. If such proves true, it is considered likely that the heavy guns will probably be Vickers-Maxims, water cooled, and Colts, each weighing in the neighborhood of 50 pounds with tripod. The lighter type will probably be Lewis guns, weighing 25 pounds, and Benet-Mercier guns, which weigh considerably more than the Lewis, together with a possible third type—the so-called portable Hotchkiss—which is now being manufactured, and which will shortly be submitted to the United States for trial. This gun weighs only 16 pounds.

In spite of this, however, it is by no means certain that the true machine gun will entirely remove the necessity of developing a smaller weapon of offense and defense, less effective in mass fire perhaps than the machine gun, which will be, in all probability, an adaptation of machine-gun principles to the army rifle—in short, a machine rifle.

Already the gunsmiths of the world are attempting to supply a demand for such a weapon. Not very long ago one was submitted to the War Department. This rifle, while capable of functioning in every way claimed for it by its sponsors, was not accepted chiefly because it weighs 10½ pounds. The Ordnance experts believe that to be practical a machine rifle should weigh no more than 9½ pounds. As an indication of what the rifleman of the future may expect in the way of a weapon, however, this machine rifle is of extreme interest, since it demonstrates beyond contravention that it is not only possible but practicable to produce such a weapon.

The gun, a Hotchkiss, was manufactured at the Coventry, England, plant of that concern, and was designed to be purely and simply a shoulder gun, and is equipped with a bayonet. If a tripod becomes necessary, however, the need is supplied by an ingenious device. To the bayonet sheath is affixed a metal strip, which may be opened out to do duty as a leg, and when the barrel of the gun is passed through a band, also on the bayonet scabbard, a thoroughly utilitarian rest is provided.

The rapid-fire principle of the Hotchkiss machine rifle permits clips of ten cartridges to be fired at the rate of 300 a minute, when set for automatic work. All that is needed is to set the gun for automatic functioning. The rifle can also be made semi-automatic; that is, the ten cartridges in the clip may be fired by pressing the trigger for each shot. In addition to this, a magazine, separate and apart from the clip, may be

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By STEPHEN TRASK

Part 4—THE BERTHIER QUICKFIRER

The new Berthier Quickfirer, now being tested by the Navy Department. Illustration shows the air-cooled type.

WHEN the onreaching hordes of Germany swept across Belgium toward Liege, at the outbreak of the European war, battered down the defences of the city and poured in to occupy, the Pipier Works, where a new machine gun was being manufactured, was abandoned.

Within the factory were blue-prints and working models of the quick-firer. The shops were even then busy constructing jigs, tools, gauges and special machinery for the manufacture of the machine guns for the company owning the patents.

But while the workmen dropped their tools and joined the exodus of citizens, abandoning the new gun to capture, one of the directors of the company came clear through the confusion and peril.

Ultimately he regained Paris. With him he brought a single set of blue-prints and a badly worn working model of the rapid-firer.

Of the other models and working drawings which fell into the hands of the German invaders, nothing is known save that it is believed—but not verified—that from those blue-prints and models were constructed the "one-man" machine gun with which battle rumor says the Kaiser's men are equipped.

From the model which reached Paris—a gun chambered for Belgian ammunition, 40,000 rounds of which had already been fired from it—new guns were constructed, and at the present time these new quick-firers are being given final trials at the Marine Corps Rifle Range, Winthrop, Md.

The new machine gun is called the Berthier. It is the invention of General Andre Berthier-Pacha, of the French army, who took out patents upon it about eight years ago.

Already in the French service the Berthier quick-firer has been adapted not only to infantry use, but to cavalry use as well, and among the airmen it is known as the *mitrailleuse d'Action Berthier*. A fourth type, with a steel shield, has been developed for trench use.

After the capture of the Pipier Works at Liege, the Hopkins & Allen Company, gunsmiths, of Massachusetts, made arrangements with General Berthier to take over the sample Belgian gun and the blue-prints which had been saved from the sack of Liege, and to manufacture the quick-firers in this country.

The gun shooting Belgian ammunition was exhibited to the Government officials in Washington, who stated that if the gun could be constructed to shoot the U. S. service ammunition, with its greater chamber pressure than that of the ammunition of European armies, it appeared worthy of the most careful consideration, because of its extreme mobility.

A gun was then designed and built to meet the requirements of the United States Government. The gun functioned so satisfactorily that the Navy Department ordered a lot of five

Berthier, was given little serious consideration by the by the United States. The weapon had previously been patented in Belgium and was tested by the United States Army in May of 1917. The result of the initial testing was that the gun did not meet the Army's requirements. However, the Marine Corps tested the Berthier automatic rifle soon afterward and deemed the weapon satisfactory. The Army reconsidered the suitability of the arm and placed an order for 5,000 Berthier automatic rifles on October 2, 1917. The Navy also ordered an additional 2,000 for Marine Corps use. The Berthier automatic rifles were to be manufactured by the United States Machine Gun Company, a newly formed subsidiary of the Hopkins & Allen Company. However, a number of difficulties, including serious financial problems, soon arose and plans to produce the Berthier automatic rifle were dropped after only a handful of prototypes had been fabricated. The Berthier was chambered for the standard U.S. .30 caliber (.30-06) cartridge and fired at the rate of approximately 480 rounds per minute. The cartridges fed from a 30-round detachable box magazine. The weapon weighed about 15 pounds and each loaded magazine weighed 2 pounds, 5 ounces. The Berthier was fitted with a bipod and could be fired from the shoulder or hip. None were issued to our troops. From all indications, the Berthier would have been a good weapon, but it was never fielded in combat. The Doughboys needed automatic rifles in a hurry and couldn't wait for problems encountered with Berthier production to be overcome. The realities of the war demanded that our troops be armed with any available automatic rifle. For this reason, the War Department turned to our French allies.

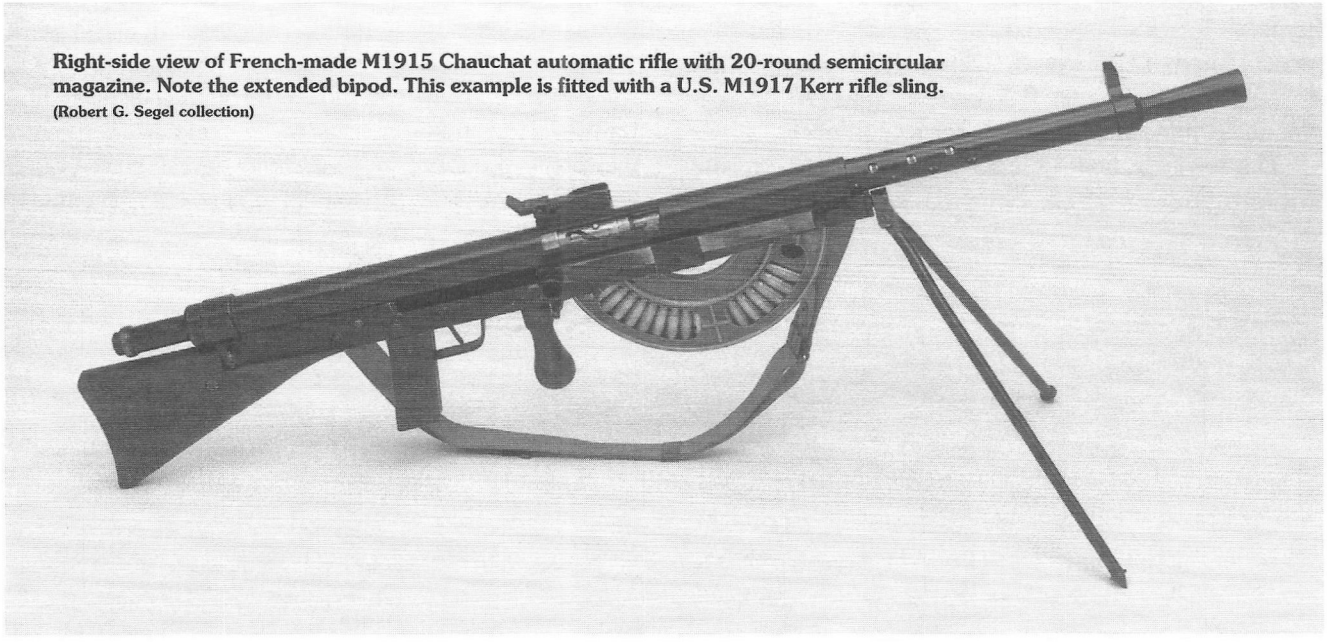
(above, left) Illustration from 1917 *Arms and the Man* magazine depicting the Hotchkiss Automatic Rifle. This French-designed weapon was considered as a "back-up" in the event that the Browning Automatic Rifle (BAR), then under development, was not satisfactory. Two Hotchkiss Automatic Rifle prototypes in U.S. .30 caliber (.30-06) were fabricated and sent to Springfield Armory in 1917 for testing. The BAR proved to be a success, and further development of the Hotchkiss Automatic Rifle was dropped by the United States in January of 1918. ***(American Rifleman* magazine)**

(left) Illustration from 1917 issue of *Arms and the Man* magazine showing the Berthier Automatic Rifle ("Quickfirer"). In October of 1917, the U.S. Army ordered 5,000 of these French-designed weapons, and the U.S. Marine Corps requested 2,000. The arm was to be manufactured by the "United States Machine Gun Company," a hastily organized subsidiary of the Hopkins & Allen Company. Production and financial difficulties resulted in no weapons of this type being manufactured in the United States other than a few prototype examples. The BAR was fielded instead of the Berthier Automatic Rifle. ***(American Rifleman* magazine)**

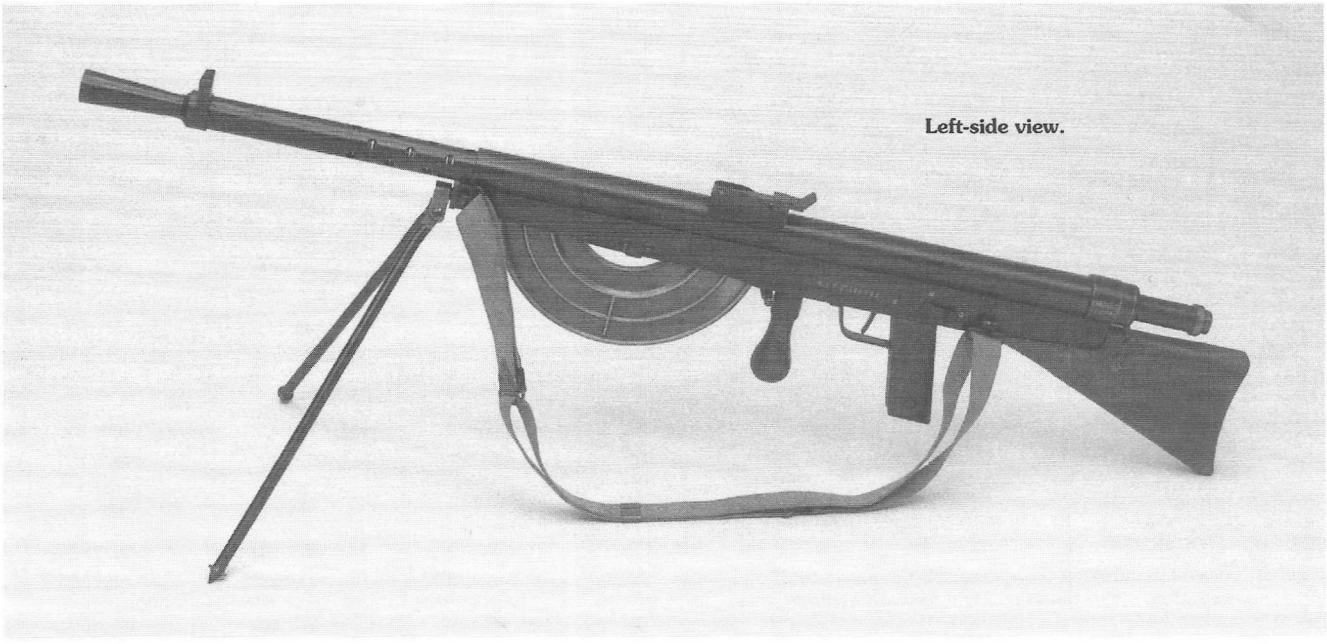
French M1915 Chauchat Automatic Rifle

At the time of the outbreak of the First World War in 1914, the French, along with everyone else, lacked a true automatic rifle in their small arms inventory. Fortunately, a French Army Captain, Louis Chauchat, had been working on such a weapon at the Puteaux Arsenal between 1903 and 1910. Captain Chauchat worked in conjunction with the master armorer of the facility, Charles Sutter. The weapon developed by Chauchat and Sutter was notable for its simplicity and low-cost construction due to the extensive use of sheet metal and stamped components. Virtually all other weapons of the period were made of solid milled components that were durable but expensive and heavy. Although some problems were apparent, the design was sufficiently promising to warrant further development work. One hundred preliminary Fusil-Mitrailleur (machine rifles) of this pattern were constructed in 1913, and some were used early in the war to arm aviators.

The declaration of war in 1914 spurred increased development of the design and, in 1915, 50,000 improved weapons of this type were ordered by the French Army. The weapon was officially known in French service as the "Le Fusil Mitrailleur 1915,



Right-side view of French-made M1915 Chauchat automatic rifle with 20-round semicircular magazine. Note the extended bipod. This example is fitted with a U.S. M1917 Kerr rifle sling.
(Robert G. Segel collection)



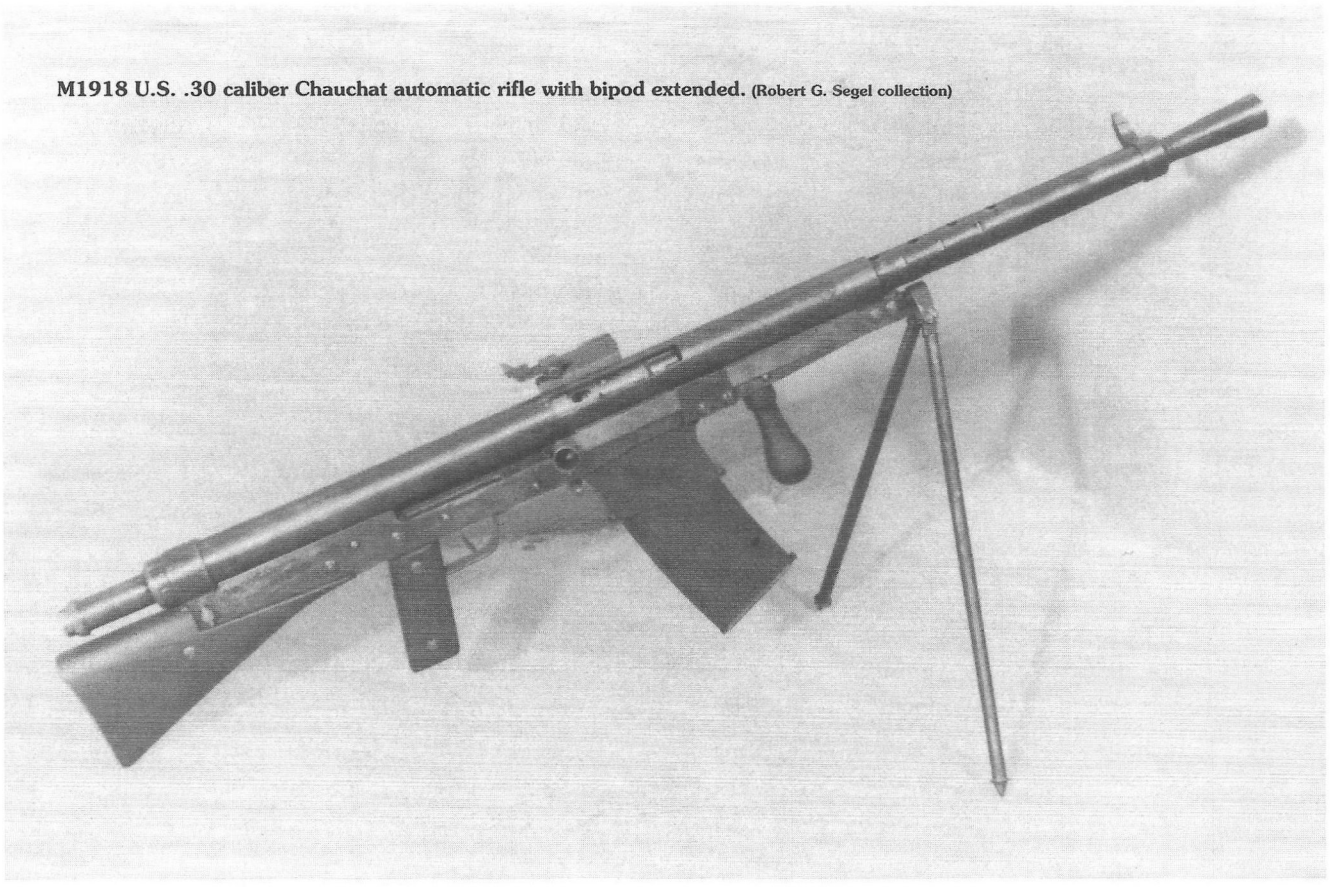
Left-side view.

CSRG." "CSRG" represented **C**hauchat, **S**utter, Paul **R**ibeyrolles (plant production manager) and **G**ladiator Works (the factory where the weapons were produced). A second contract for 25,000 Chauchat automatic rifles was given to a French ordnance facility at St. Chamond in December of 1916.

The Model 1915 Chauchat automatic rifle was chambered for the standard French 8mm cartridge and was adapted for use with a semicircular detachable magazine holding 20 rounds. Loaded magazines weighed almost two pounds. The weapon weighed 19 pounds and was long recoil operated. It fired fully automatic at a rate of some 300 rounds per minute. The weapon was equipped with a bipod in order to support the barrel when firing from the prone position. A front handgrip (often described as a "tool handle") was also incorporated. The receiver was marked to denote the appropriate position for the selector lever; "S" (safety), "M" (fully automatic) and "C" (semiautomatic).

The French first utilized the Chauchat on the Western Front in 1915. Since an automatic rifle was an essentially new type of infantry weapon, new tactics had to be developed to properly utilize the arm. An automatic rifle school was established by the French Army in Paris to train instructors on the proper techniques of using the Chauchat. These instructors were then assigned to various infantry units in order to teach the techniques to the soldiers assigned to Chauchat duty. It was soon realized that the weapon would best be utilized by two-man teams consisting of a "gunner" and "loader." The technique of "walking fire" was felt to be the best manner in which to take advantage of the Chauchat's firepower and portability. "Walking fire" was basically firing the weapon while marching toward the enemy in order to keep their heads down and suppress return fire. While this may have sounded like a good idea in theory, it didn't work out so well in actual practice. Maintaining a steady marching pace when stumbling through shell holes and barbed wire emplacements while firing an automatic weapon was more difficult than some chair-bound theorists may have imagined. The tactics eventually

View of left side of receiver. This view clearly shows the "tool handle" foregrip, the pistol grip behind the trigger, rear sight and receiver markings including serial number. Note also the selector lever ("S" = safety; "M" = fully automatic and "C" = semiautomatic).
(Robert G. Segel collection)



M1918 U.S. .30 caliber Chauchat automatic rifle with bipod extended. (Robert G. Segel collection)

shifted from emphasis on "marching fire" to using the weapon for infantry support while firing from some form of cover whenever possible. By the time of America's active involvement in the war, the French Army was well supplied with Chauchats, and large numbers of the weapons were in use in the front lines. Since we lacked any modern automatic rifles at the time, the United States, almost by default, was forced to purchase Chauchat automatic rifles from France in order to equip the AEF units deploying to France. In order to procure as many weapons as possible in the shortest period of time, the United States adopted the M1915 Chauchat "as is" from the French.

The fact that the M1915 Chauchat was chambered for the French 8mm cartridge was obviously undesirable, as it created additional supply problems but, initially, there was no alternative. While the U.S. Army was procuring standard Chauchat automatic rifles from the French, plans were formulated to develop a version of the weapon chambered for the standard U.S. .30 caliber (.30-06) cartridge in order to simplify supply problems. It was also felt that the American cartridge was markedly superior to the French 8mm in ballistic performance. An added bonus was that the rimless .30-06 cartridge would likely be more reliable in an automatic weapon than the rimmed 8mm round. The modified Chauchat was designated as "Caliber .30 Chauchat Automatic Rifle, Model of 1918" and was adopted by the U.S. Army and Marine Corps.

Preliminary accounts indicate that the Americans were not at all impressed with the crude-appearing French weapon, particularly compared to the Lewis light machine gun (to be discussed in detail later) with which some units had been previously equipped. The Doughboys soon fractured the pronunciation of the French name Chauchat, and the weapon soon became widely known as the "Show-Show" gun in the AEF. The first recorded use of Chauchats by the Americans was in the hands of Doughboys of the 1st Division on October 21, 1917, in the Sommerville sector, east of the French city of Nancy.

When first employed by the French back in 1915, a number of problems soon became apparent with the Chauchat. The same problems were quickly noted by the Doughboys when they began to use the weapon in combat. The problems included long-range inaccuracy due the recoil operated mechanism, poor balance and unreliability. The component that caused the most problems was the flimsy magazine that was prone to damage. The sides of the magazine were open, and it

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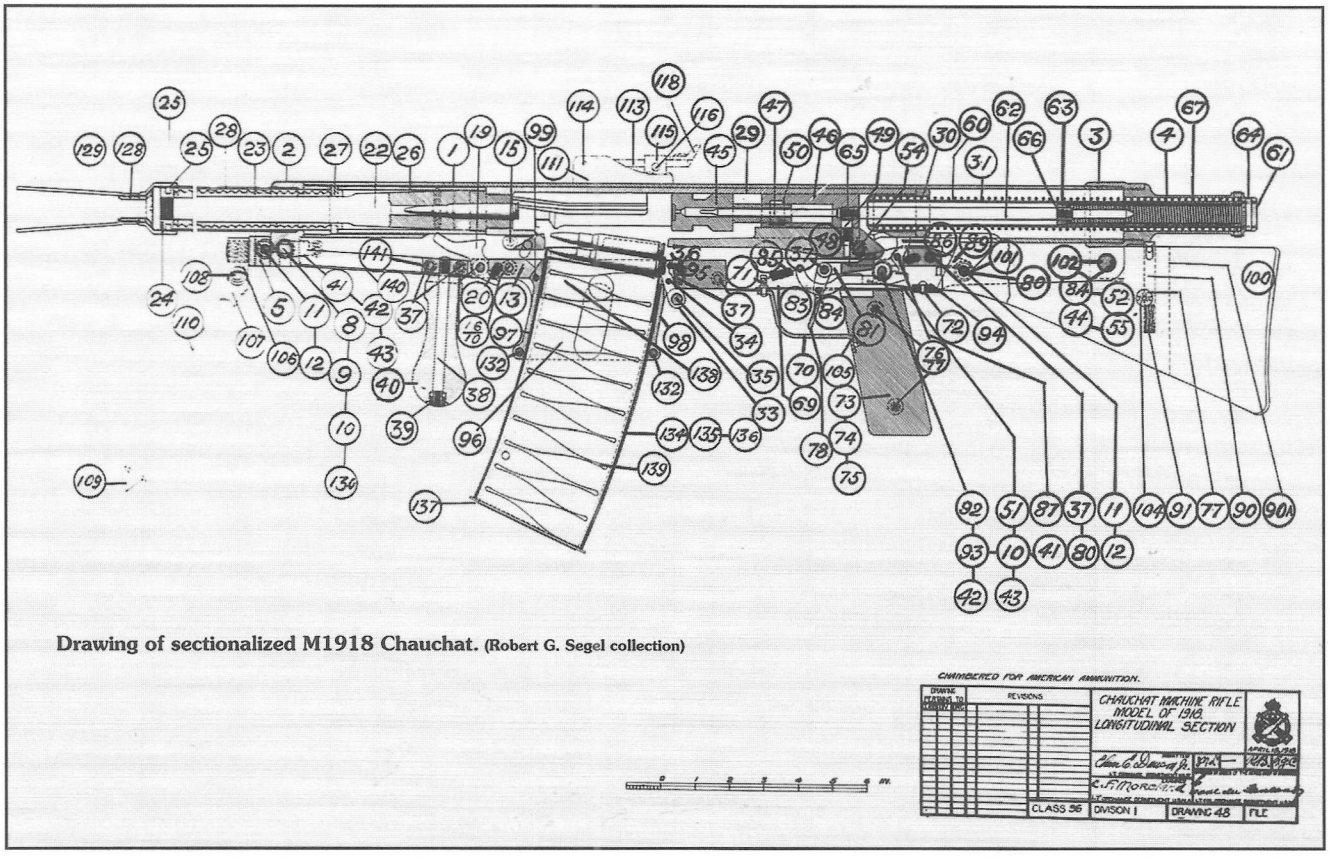


Drawing of sectionalized M1918 Chauchat. (Robert G. Segel collection)

Grouping of accessories for the M1918 Chauchat, including canvas ammunition carrying bag, loaded magazines, wood ammunition box, smaller ammo box with belt loops, antiaircraft sight and "gunner's belt" with metal cup to hold the butt of the weapon. (Robert G. Segel collection)

U.S. Army photo of Doughboys of the 137th Infantry Regiment firing M1915 Chauchat automatic rifle in combat during WWI. Note the soldier at right holding a spare magazine. Photo taken July 29, 1918. (National Archives)

(above) U.S. Army private Robert Robinson, Company E, 125th Infantry, 32nd Division cleaning is M1915 Chauchat automatic rifle. Photo taken June 22, 1918. (National Archives)

(right) Doughboy Philip Tangor of Company I, 308th Infantry Regiment, 77th Division talking to an elderly French man identified as Mr. Beloux who, along with his wife, was a prisoner of the Germans for four years. Photo taken November 6, 1918, in Brieulles sur Bar, Ardennes, France. Tangor is carrying a M1915 Chauchat automatic rifle over his right shoulder. (National Archives)

Text continued from page 149.

could easily be clogged by mud. The Chauchat was also plagued by overheating, which resulted in numerous stoppages. There were many contemporary reports regarding the unreliability of the Chauchat in United States service. Two passages from *The Doughboys* are illustrative of the feelings of many American troops:

...Their automatic rifles were Chauchats, said to have been made of battlefield scrap but believed by the Doughboys to have been fashioned from rusty sardine cans.

...some green 4th Division lads (were) trying to figure head or tail out of French Chauchats they had just been issued with instructions in French... Private Bailey... conducted classes in how to affix a half-moon clip of flimsy construction to that beastly looking weapon.

Another passage indicated that the American troops soon learned how to:

...(strip) a Chauchat when the flimsy, half-moon magazine had jammed its crudeness...

Many other reports mentioned mud-encrusted Doughboys uttering loud curses while kicking their jammed Chauchats in an attempt to get them working. Years after the war, noted American arms designer Melvin Johnson, Jr. (inventor of the Johnson rifle and light machine gun) made the following comments about the Chauchat in his book *Rifles and Machine Guns*:

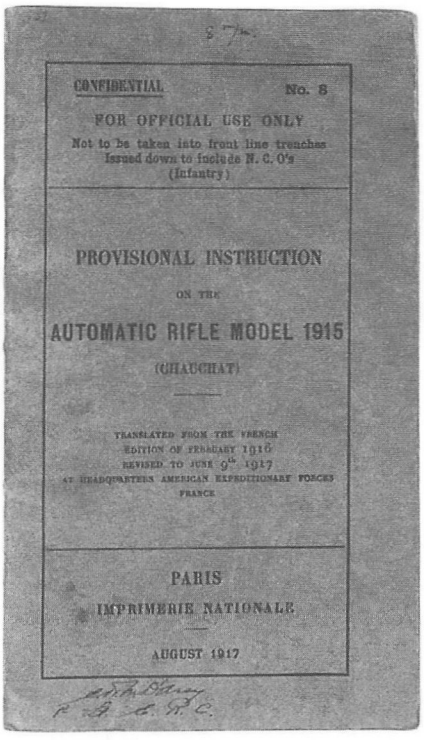
...a very crudely built weapon, it developed frequent stoppages. When it jammed, the stoppage was generally remedied by throwing the gun away. Its ingenious design warranted the manufacturing care it never had. Its long-recoil action suffered a bad reputation as a result.

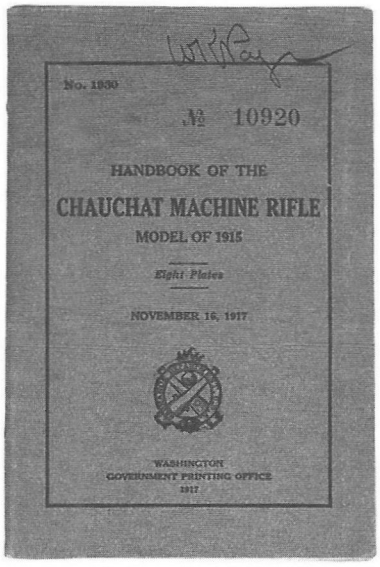
Despite its problems, the War Department purchased 15,988 standard M1915 8mm Chauchat automatic rifles from the French including 2,200 that were shipped to the United States for training purposes. It has been reported that the United States actually acquired about twice as many Chauchats as originally anticipated to replace the large numbers that were thrown away by our troops!

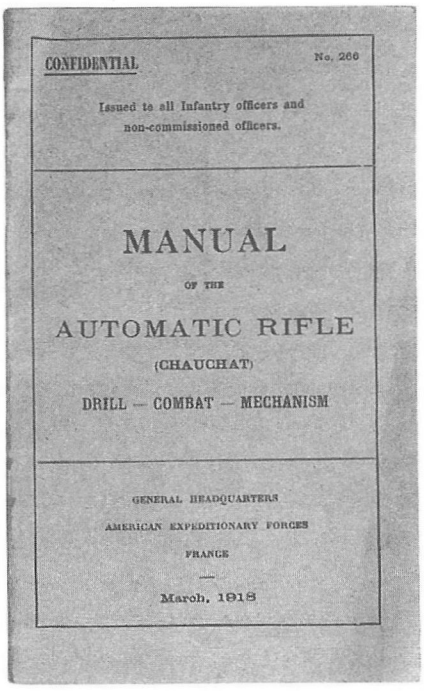
By early 1918, the Gladiator factory was given a contract to manufacture the .30 caliber "M1918" U.S. version of the Chauchat for the American government. Modifying the design was not, in theory, particularly difficult, as the barrel was the only substantive

Right-side view of M1918 Chauchat modified for U.S. .30-06 cartridge with bipod folded.
(Hayes Otoupalik collection)

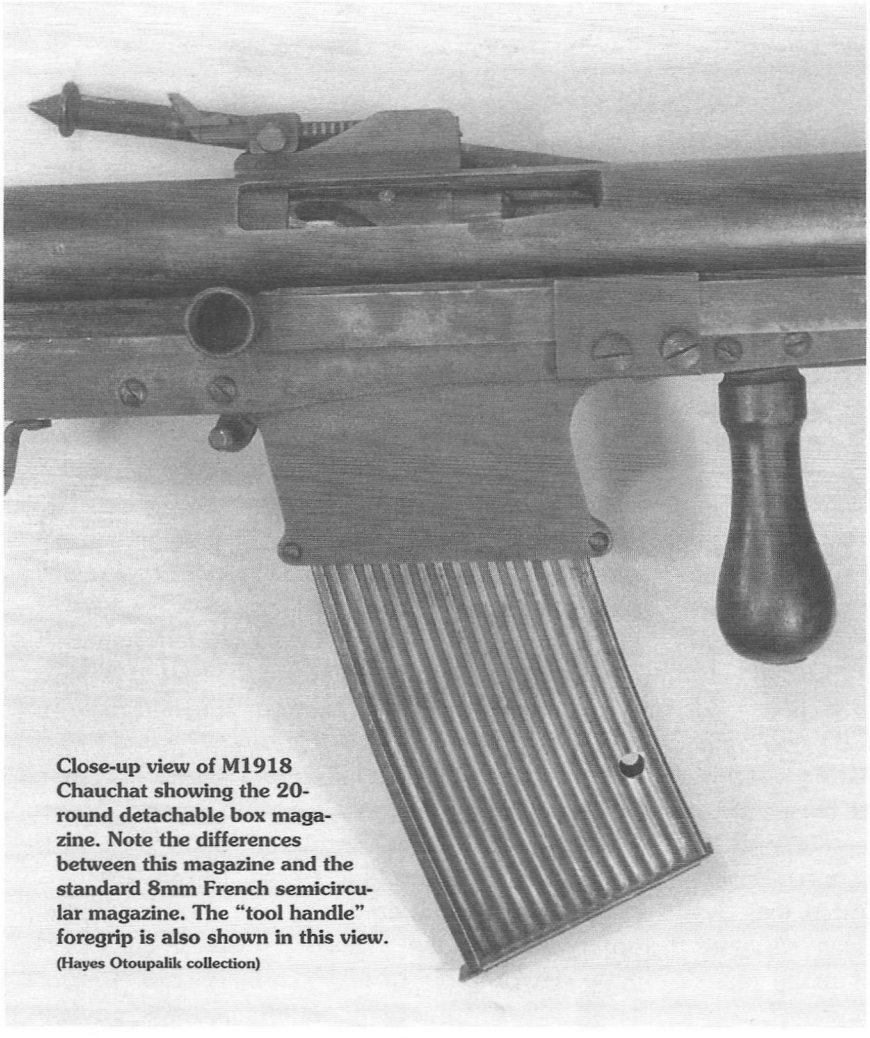
Left-side view of M1918 Chauchat.



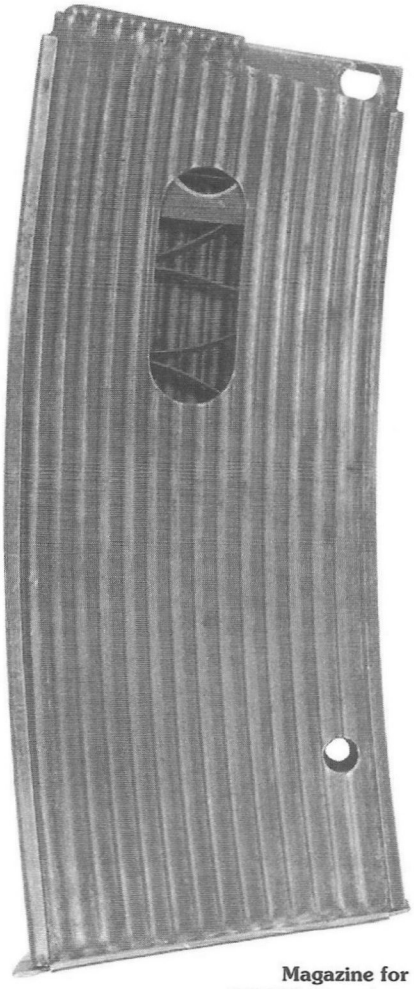




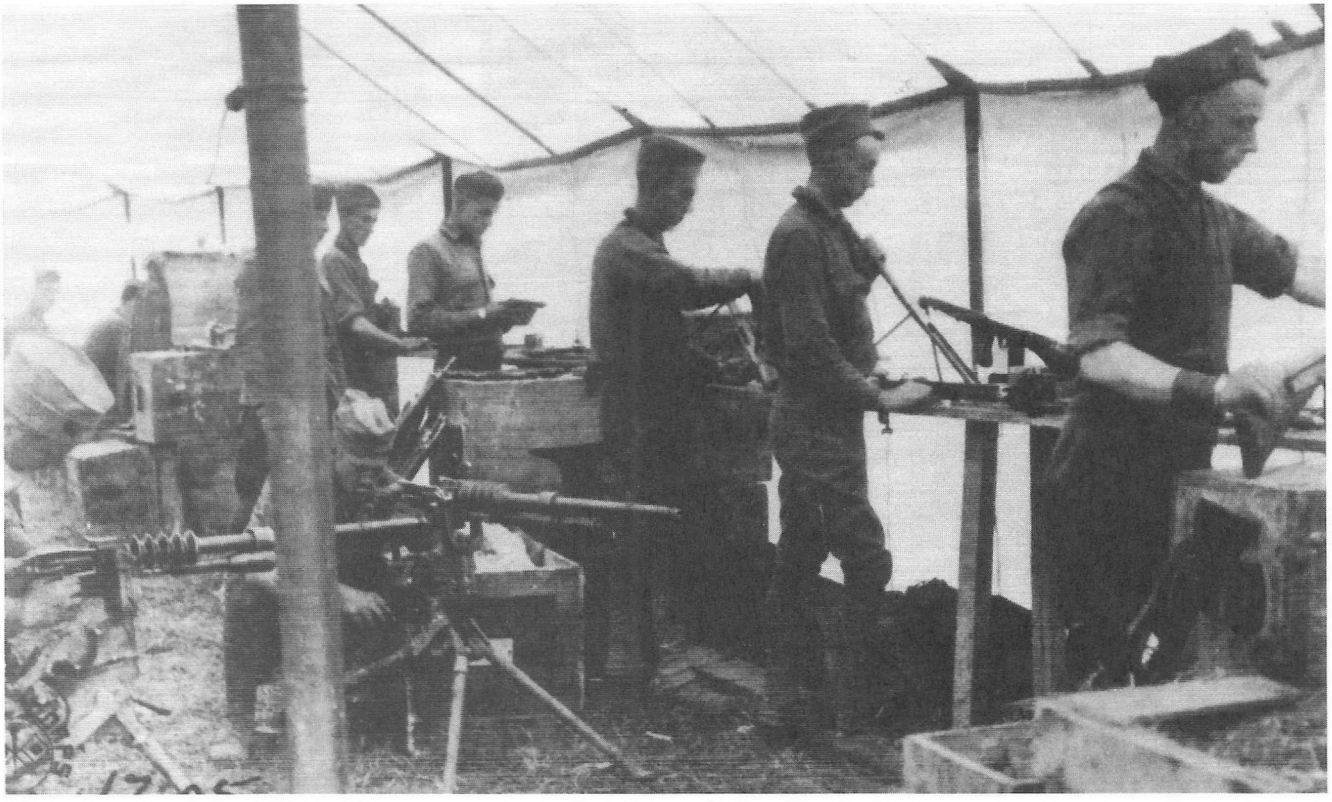
U.S. Army manuals for Chauchat automatic rifle.
(Robert G. Segel collection)



Close-up view of M1918 Chauchat showing the 20-round detachable box magazine. Note the differences between this magazine and the standard 8mm French semicircular magazine. The "tool handle" foregrip is also shown in this view.
(Hayes Otoupalik collection)



Magazine for M1918 Chauchat.
(Hayes Otoupalik collection)



Armorer's tent in France during WWI. The ordnance personnel are working on a variety of weapons including Chauchat automatic rifles, M1914 Hotchkiss machine guns and M1911 .45 pistols. (Robert G. Segel collection)

change other than replacing the semicircular French magazine with a detachable box magazine holding 16 rounds. The bipod was also changed along with different range graduations for the sights. If the 8mm version was unreliable, the .30 caliber version was a disaster. The barrels did not have the proper dimensions, and there were other manufacturing flaws apparent in the weapons. Also, the more powerful .30-06 cartridge put added stress on the mechanism. From all indications, the U.S. .30 caliber version was a terrible weapon and did much to give the Chauchat the poor reputation that it retains to this day. Although some 19,241 .30 caliber Chauchats were eventually manufactured, relatively few were actually issued (which was a good thing). Konrad Schreier, Jr. stated that:

I have fired both the 8mm and caliber .30 Chauchats. The 8mm works reasonably well but the .30 jams very easily from overheating, assuming the parts stand up! Both are not accurate at any range past about 100 yards!

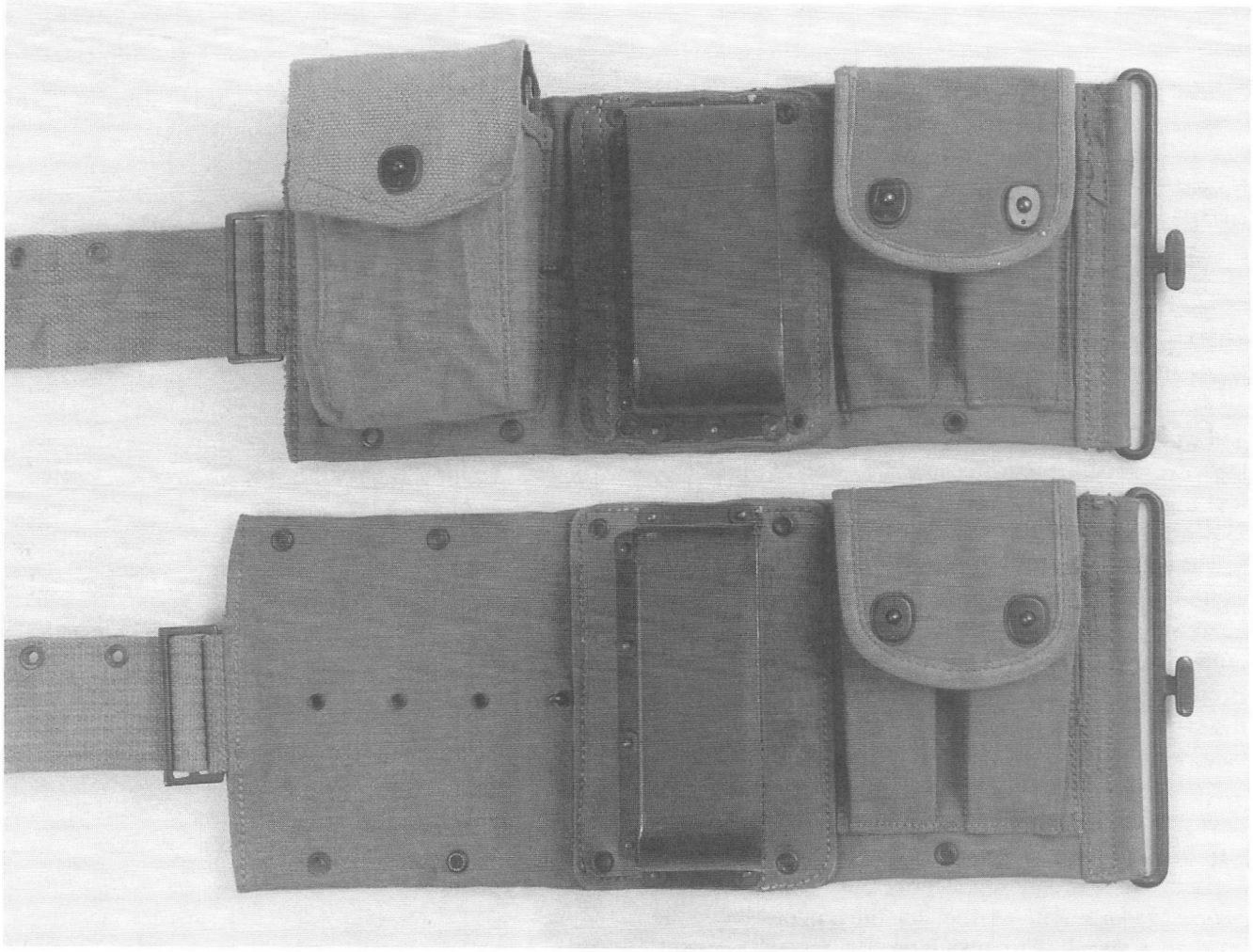
Few infantry weapons have as poor a reputation today as does the Chauchat. It is reported that the Germans were not interested in utilizing captured Chauchats although they made use of many other Allied weapons. While much of the Chauchat's poor reputation is justified, the weapon probably doesn't deserve the almost universal condemnation heaped upon it today. Actually, the weapon was adopted by the French primarily as an interim automatic rifle until better designs could be fielded. The exigencies of the war prevented this from happening. It should be remembered that, if there hadn't been any Chauchats, the French or the Americans would not have had any automatic rifles during most of the war. Few would argue that having *no* automatic rifle would have been better than the Chauchat. Despite the weapon's flaws, there were many instances in which it gave a good account of itself against the Germans. Several examples from *The Doughboys* follow:

Private Nels Wold, a Chauchat gunner, with a lone carrier, got four machine guns that afternoon...

The Doughboy brigade never forgot a little runner named Frank T. Bart. He was supposed to carry a message back to battalion to say that his company was held up by machine gunners near Medeah Farm. Instead, he picked up a Chauchat and ran ahead of the stalled line, killing the gunners.

There are many other passages found in contemporary accounts that indicate the Chauchats provided good service to our troops on a number of occasions. This is not to downplay the obvious problems

Photo of U.S. troops firing Chauchat automatic rifles in combat. (Robert G. Segel collection)



Comparison between "gunner's belt" for BAR (top) and Chauchat (bottom). Note the difference in configuration of the metal cups. The cup for the BAR is deeper and thicker than the cup for the Chauchat. Also, the Chauchat belt does not have a magazine pouch behind the cup as does the BAR belt. Both belts are fitted with a magazine pouch for the M1911 .45 pistol. (Robert G. Segel collection)

encountered but rather to point out that the Chauchat was not a totally useless weapon.

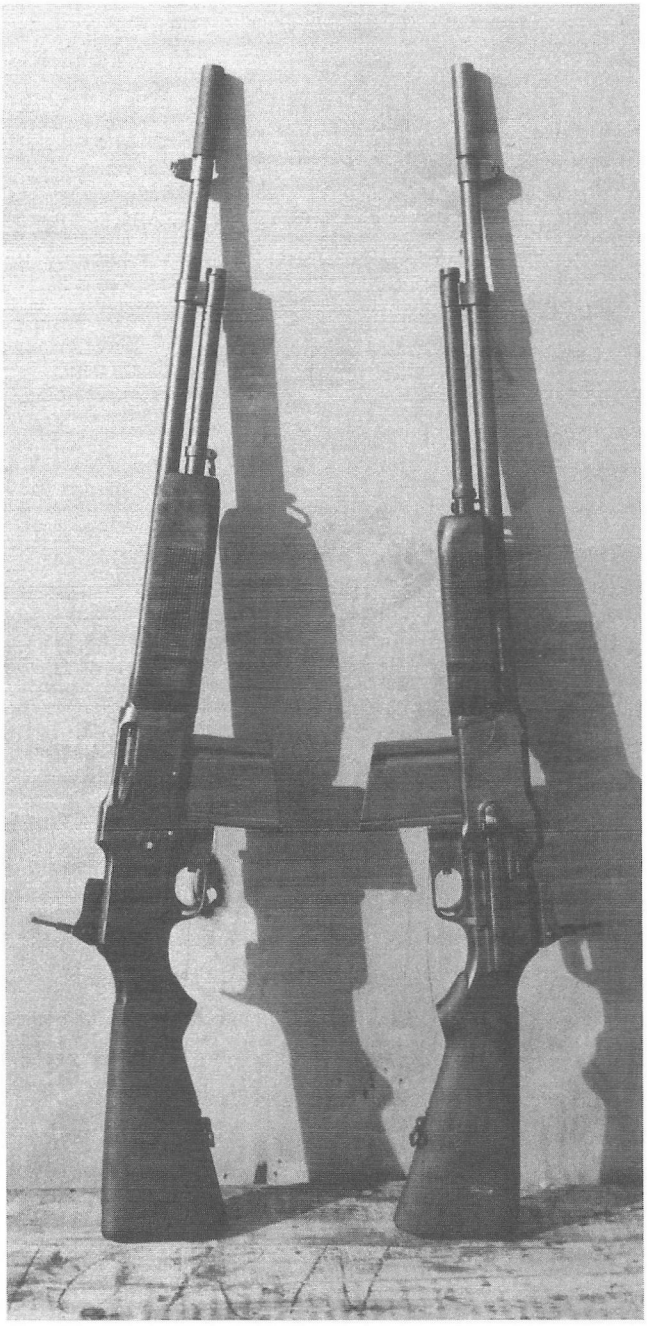
A cartridge belt was manufactured for the Chauchat automatic rifles in U.S. service. One interesting feature of the belt was a metal "cup" fastened to the right side into which the butt of the weapon fitted. This enabled the Chauchat to be fired in the "marching fire" manner still officially taught by instructors. A removable antiaircraft sight that mounted on the rear sight was also produced.

By late summer of 1918, the marvelous Browning Automatic Rifle was beginning to be issued to the Doughboys, and the unpopular Chauchats were gladly discarded. Most of the .30 caliber versions as well as the 8mm guns were destroyed, and surviving examples, especially of the former, are not very common. Some Chauchats remained in the hands of Doughboys through the end of the war. Many Doughboys had less than fond memories of the "Show-Show" but, as stated, the weapon was an important, if somewhat flawed, part of the American infantry arsenal during the First World War.

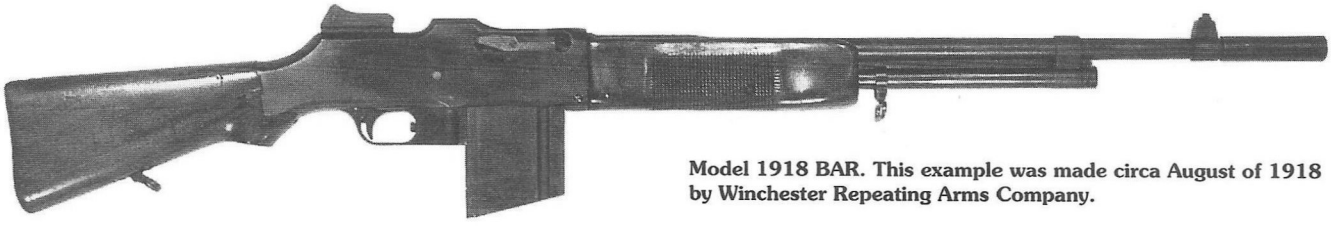
Model of 1918 Browning Automatic Rifle (BAR)

Soon after the United States became embroiled in the war, the legendary American arms designer, John Moses Browning, was in the process of developing several weapons for our military. One was an automatic rifle that was destined to become one of the most respected U.S. military weapons of all time.

An Ordnance Board was appointed on May 1, 1917, to consider various light machine gun and automatic rifle designs for potential adoption by the United States. One of the submissions to the board was an automatic rifle designed by John Browning. Browning's design was the unanimous selection of the board, and the War Department ordered that plans be made to get the weapon into production as soon as possible. Mr. Browning had done the preliminary work on his weapon in conjunction with the Colt Firearms Manufacturing Company, and the firm owned production rights to the weapon. The arm was soon known as the Browning Automatic Rifle, or simply the "BAR," and the government wasted no time in securing the manufacturing rights from Colt. Colt wished to manufacture the weapon for the government and sought to build a new plant in Meridan, Connecticut, since its main factory in Hartford was currently operating at near-peak capacity. Colt's request was not approved by the Ordnance Department, as the lag time necessitated by building a new facility, acquiring the necessary manufacturing equipment and training a work force was too great. The government wanted the BAR in production as rapidly as possible. In September of 1917, the Ordnance Department negotiated with Colt to transfer the BAR project to the Winchester Repeating Arms Company. This transfer was soon consummated, and Winchester assumed the lead role in the BAR production program. John Browning was well acquainted with Winchester since he had designed many of the arms made by that firm. Contracts for production of the BAR were granted to Winchester, Colt and the Marlin-Rockwell Corporation.

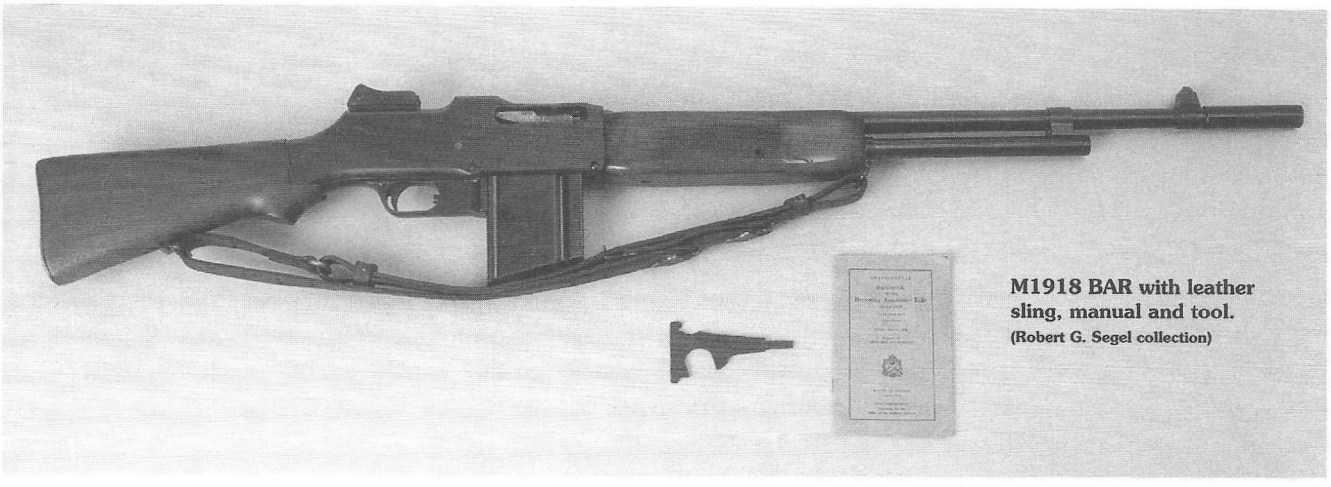


WWI-vintage U.S. Ordnance Department photograph showing right and left profile views of M1918 BARs. (U.S. Army)

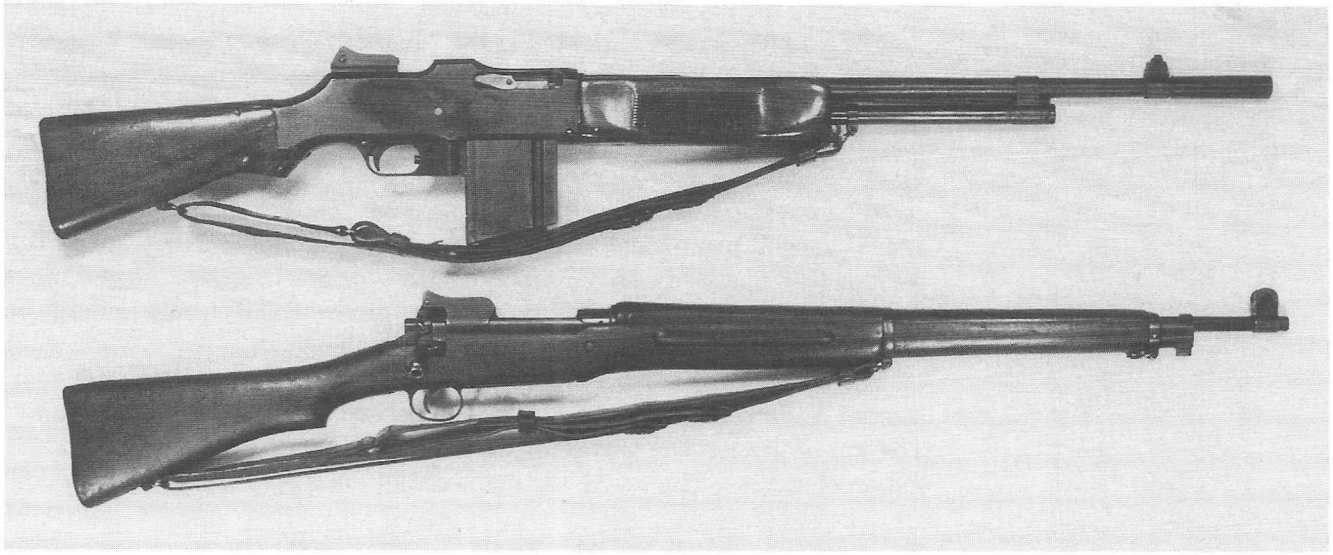


Model 1918 BAR. This example was made circa August of 1918 by Winchester Repeating Arms Company.

View of receiver markings on Winchester M1918 BAR. Note the "Browning Machine Rifle" designation and the serial number (75728).

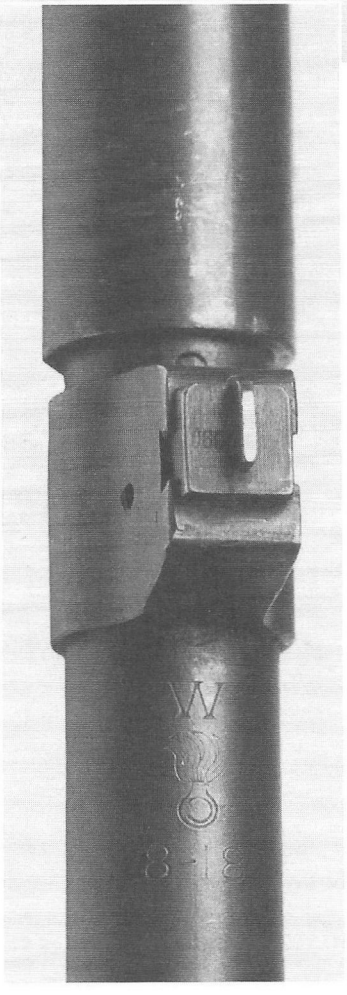


M1918 BAR with leather sling, manual and tool.
(Robert G. Segel collection)



Comparison between BAR (top) and M1917 service rifle (bottom). Note that the BAR is similar to the service rifle in size and was a true "automatic rifle" rather than a light machine gun. It is a little-known fact that the M1918 BAR and M1917 U.S. Enfield rifle shared the same pattern buttplate and rear sight.

Left-side view of M1918 BAR receiver showing non-reciprocating charging handle, selector switch and rear sight.



Soon after Winchester assumed responsibility for the BAR program, the company completed a production prototype of the weapon with assistance from John Browning. It is reported that Winchester borrowed the single hand-made prototype from Colt and completed the necessary drawings and blue-prints over a weekend. By working literally around the clock, the Winchester engineering team completed the drawings and returned the prototype to the Colt factory the following Monday morning.

The new weapon was adopted as the "U.S. Browning Automatic Rifle, Caliber .30, Model of 1918." The arm weighed 16 pounds which, considering contemporary automatic weapons, was quite light. The weapon had a 24" tapered barrel and was 47" in overall length (including a removable cylindrical flash hider). The BAR was chambered for the standard U.S. .30 caliber (.30-06) cartridge and could be fired semiautomatically or fully automatically at a rate of approximately 550 rounds per minute and a muzzle velocity of about 2,800 f.p.s. The weapon was equipped with a 20-round detachable box magazine. Magazines of larger capacities were tested but not put into production. The rear sight of the BAR was almost identical to the M1917 Enfield rifle sight.

The M1918 Browning Automatic Rifle was finished in an attractive commercial grade blue and had a stock and checkered fore-end made of walnut. The top of the receiver was stamped with the name of the manufacturer and the serial number. The barrel was marked with the month and year of produc-

Close-up view of barrel markings showing manufacturer's initials ("W" for Winchester) and date of production ("8-18" for August 1918). Note the cylindrical flash hider in front of the sight.

U.S. troops of the 2nd Battalion, 329th Infantry, training with M1918 Browning Automatic Rifles in France. Photo taken October 5, 1918. (National Archives)

tion and the initials of the maker. Sling swivels were fitted to accommodate a sling similar to the M1907 rifle sling. The BAR sling had three adjustment "claws" and was longer than the standard rifle sling. A cartridge belt with a metal "cup" for the butt was also standardized along with a similar cartridge belt (without the metal cup) and extra bandolier for the "assistant gunner." The "automatic rifleman" carried a total of six magazines in his belt (120 rounds) along with a spare parts kit (housed in a leather box) and two magazines or pairs "half-moon" clips for his handgun (M1911 pistol or M1917 revolver). The "assistant gunner" carried the same number of BAR magazines plus forty rounds of ammunition for his bolt action rifle (M1903 or M1917).

Winchester's initial contract was for 25,000 BARs and the first production sample was completed in March of 1918. The firm was in full production by June, and 4,000 BARs were delivered to the government that month with 9,000 following in July. Winchester did an exemplary job as the weapon progressed from the prototype stage to full production in only ten months. Colt and Marlin-Rockwell began to turn out BARs soon after Winchester got into full production.

Text continued on page 162.

(below) U.S. soldier posing with M1918 BAR in the "marching fire" mode at the Ordnance Department's General Headquarters, Chaumont, France, November 9, 1918. (U.S. Army Military History Institute)

Grouping of M1918 BAR accessories including leather sling (with three metal adjustment hooks), bandoleer with extra magazine and "gunner's belt" with attached metal cup to hold the butt and M1911 .45 pistol.

Winchester factory poster of M1918 BAR. (U.S. Army)

U.S. Army photograph of Lt. Val A. Browning, son of John M. Browning, demonstrating his famous father's automatic rifle in France. The officer at the right holding the extra magazines is identified as Lt. Julian Prado. Photo dated October 5, 1918. (U.S. Army Military History Institute)

U.S. troops using M1918 BARs and M1903 rifles in combat during the First World War.
(U.S. Army Military History Institute)

Text continued from page 159.

BARs began to arrive in France in July of 1918 and the first unit equipped with the new weapon was the U.S. Army's 79th Division. The first recorded use of the BAR in combat was on September 13, 1918, when the weapon was fired against the enemy by Lt. Val A. Browning, son of the inventor. The BAR was used extensively during the Meuse-Argonne campaign in late September. The authorized allowance of automatic rifles (either BAR or Chauchat) was sixteen for each infantry company or 768 to a division.

The BAR was an immediate success, especially compared to the problem-plagued Chauchat. Unfortunately, the weapon was not in use for a long period of time before the war ended. A typical reaction among the Doughboys is related in *Make the Kaiser Dance*:

Unusual WWI-era photo of a M1918 BAR mounted on an experimental antiaircraft mount and fitted with a prototype 40-round magazine. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

The day after the Armistice we got word to turn in our Chauchats and draw Browning Automatic Rifles. That BAR was so much better than that damn Chauchat. If we'd only had the BAR six months before, it would have saved so many lives.

This informal assessment is echoed by the official report on ordnance production authored after the war by the Assistant Secretary of War, Benedict Crowell:

The Browning Automatic Rifles were highly praised by the officers and men who had to use them. Although these guns received hard usage, being on the front for days at a time in the rain and when the gunners had little opportunity to clean them, they invariably functioned well.

Not only our own forces but the allied armies as well were enthusiastic about the Browning guns...as soon as they had seen them in action. The best proof of this is that in the summer of 1918 the British, Belgian and French governments all made advances to us as to the possibility of the United States producing Browning Automatic Rifles for their respective forces. On November 6, 1918, a few days before the end of hostilities, the French high commissioner requested that we supply 15,000 light Browning rifles to the French Army. We would not make this arrangement at the time because we thought it inadvisable to divert any of our supplies of these guns from our own troops until the spring of 1919 when we expected that our capacity for making light Brownings would exceed the demands of our own troops. Our demand for the lighter guns, incidentally, was far greater than we had originally expected it to be. As soon as the Browning rifle was seen in action, the General Staff of our Expeditionary Forces at once increased by 50 per cent the number of automatic rifles assigned to each company of troops, and we were manufacturing to meet this augmented demand when the war ended. By spring of 1919, we expected to be furnishing light Brownings to the British and French Armies as well as our own.

By the time of the Armistice, some 43,368 BARs had arrived in France, although ever-increasing numbers were on the way. Unlike many weapons, the BAR remained in production after the Armistice. A total of 102,125 were produced as follows:

Winchester	47,123
Marlin-Rockwell	39,002
Colt	16,000

The M1918 BAR remained the standard U.S. automatic rifle after the war. Slightly modified versions saw production and wide use during World War II and

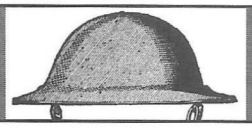
Korea and some were used as late as the Vietnam war. Few weapons have as good of a reputation as the BAR. While somewhat of an anachronistic weapon by the time of the Second World War, the BAR was very much "state of the art" in World War I. As aptly stated by one writer:

The ultimate proof of the BAR's success is the answer of any Doughboy or G.I. who used one would give when asked what he thought of it; practically to a man they would answer, "It is the best damn gun there ever was."

Many would agree.

While used for a much shorter period of time than the Chauchat, the BAR proved to be an unqualified success and set the standard for automatic rifles for the next couple of decades after the war. The Browning Automatic Rifle served the Doughboys of the AEF briefly but extremely well.

Collector Notes



As with all of the automatic weapons discussed here, these automatic rifles are covered by provisions of the National Firearms Act of 1934, which strictly controls the sale and possession of such arms. Details on the legal aspects of the ownership of such weapons may be found in Table #56 on page 278.

Some people may be a bit surprised to learn that machine guns, including automatic rifles, are quite popular with some collectors. For persons residing in states and municipalities that allow for the possession of such weapons, owning them can be an enjoyable enterprise. The amount of "red tape" involved may dissuade some from acquiring automatic rifles but the somewhat cumbersome process is worth the effort.

Chauchat Automatic Rifle

Both the M1915 (8mm) and the M1918 (.30 caliber) Chauchats are rather uncommon on the collector market today. The unaltered French 8mm variants are seen more frequently than the .30 caliber version. Since the United States discarded the Chauchat immediately after the war, few have survived to this day. On the other hand, since the weapon did not remain in U.S. service after the war, none were overhauled or rebuilt so virtually all examples extant remain in their original configuration.

Prices for the Gladiator and St. Chamond-made versions seem to be about the same given comparable degrees of condition and originality. The M1918 Chauchat chambered for the .30-06 seems to be more popular with most collectors, and prices are typically somewhat higher. A few enthusiasts have "worked over" their M1918 Chauchats, and some are reported to function very well when properly "tweaked." It is too bad this wasn't done in France back in 1918!

The various accessories such as magazine pouches are not particularly common today, although the belts with the metal "cup" occasionally appear on the market. The magazines can be a bit hard to find at times. All accessories and accouterments are sought after by collectors. The best book on the Chauchat today is *Honour Bound* by Demaison and Buffetaut. Anyone wishing to learn more information about this weapon should obtain a copy.

M1918 Browning Automatic Rifle

The popularity of the BAR among collectors today reflects its popularity with former military users. All versions of the BAR enjoy high collector interest and increasing value, but the unaltered WWI M1918 is among the most desirable. Unmodified examples are not extremely common, as the majority were overhauled and/or updated to later configuration after WWI. Several thousand unaltered M1918 BARs were supplied to our British allies in the early days of the Second World War under provisions of Lend-Lease and similar foreign aid assistance. Some of these were "reimported" back into the United States during the 1950s and 1960s. They invariably remain in their original 1918–1919 factory configuration but are usually stamped with British proof and property marks on the metal. Such markings devalue such weapons for collecting, but the reduction is normally not too significant.

If a collector wishes to acquire an unaltered World War I vintage M1918 BAR, there are several key features to observe:

(1) External metal parts should be blued and not parkerized. Most M1918 BARs were subsequently parkerized when they were rebuilt following WWI. Watch out for weapons that have been subsequently commercially reblued.

(2) The initials of the maker of the barrel should match that of the receiver. In other words, a Marlin-Rockwell barrel should not, for example, be found in a Winchester receiver. The barrel dates should be WWI-vintage.

(3) Some reproduction M1918 stocks and fore-ends have been manufactured during the past few years to replace original wood that has been damaged. Make certain that the overall condition of the wood matches that of the metal. New wood on a well-worn BAR is a sure sign something is amiss.

(4) The condition of the bore should be observed. Since the BAR's barrel was not easily replaceable, "shot-out" bores are not uncommon. A well-worn bore will have a negative impact on the shooting ability of the weapon. Since many BAR owners like to shoot their weapons, this can be an important consideration. Finding the proper replacement barrel is usually an impossible task. Some BARs are purchased as "shooters," and the types of components are not really important. For collectors, however, all parts should be original in order for the weapon to qualify as a true "collector's item."

(5) The receiver must be made by either Winchester, Colt or Marlin-Rockwell. M1918A2 BAR receivers made by International Business Machines (IBM) or New England Small Arms (NESA) are WWII vintage and those made by Royal-McBee were made during the Korean War.

Potential purchasers should be aware that a number of commercial firms produced BAR receivers during the 1970s through 1980s until the law was changed to prohibit this practice. While the commercial BAR receivers can be fine for "shooters," they have no place on a collectible weapon. It should be noted that

some commercial production semiautomatic (only) weapons have recently come on the market that superficially resemble original M1918 and M1918A2 BARs. The presumed purpose of such weapons is to allow someone to own a weapon that looks like a BAR. Such weapons appear well made and are expensive, although much cheaper than an original military issue BAR. The appeal of such arms is questionable, as they serve no real purpose. In any event, such guns have had no impact on the value or desirability of genuine BARs as prices continue to increase every year.

Most BAR accessories and accouterments remain relatively easy to find today. Original WWI cartridge belts with and without the metal "cups" are rather common, and magazines are still easy to find. The correct type of magazine for a WWI BAR is blued rather than parkerized. The leather BAR slings can still be found today. The most common date observed is "1918". Virtually identical slings with steel rather than brass hardware show up from time to time but are WWII production. The later canvas BAR slings are, likewise, incorrect for use on a WWI-vintage Browning Automatic Rifle.

It is likely that the BAR will remain popular with collectors for many years to come assuming there are no negative changes in the law. A mint-conditioned 1918–1919-vintage BAR is a striking weapon and is certainly among the most attractive automatic weapons ever produced.

Machine Guns

The United States military's experience with machine guns dates back to the Civil War when the famous Gatling gun was introduced. While not an "automatic" machine gun, the hand-operated Gatling was among the first practical rapid-fire infantry weapons of its type. Several models of the Gatling gun, in various calibers, were used by the U.S. military through the Spanish-American War of 1898 and some saw very limited training use for a vew years afterward. in 1888, the U.S. Army tested an early model of the Maxim machine gun, chambered for the standard .45-70 cartridge. The results of the tests showed that the weapon had promise but was not acceptable in its existing configuration.

M1895 Colt Machine Gun

The first "true" machine gun procured by the United States military was a design patented by the prolific John M. Browning. Browning's machine gun was a gas-operated design that fed from a canvas belt. The operating lever of the weapon moved back and forth under the gun in a vertical arc. If the weapon was mounted too low to the ground, the lever could dig into the dirt thus giving the gun its informal nickname, the "potato digger." It was sometimes necessary to dig a pit in order to accommodate the swinging lever. Despite this drawback, the mechanism of the M1895 gun resulted in a very smooth-firing and dependable weapon.

The U.S. Army tested the new Model of 1895 machine gun chambered for the standard .30-40 Krag cartridge soon after the weapon's introduction. Preliminary tests revealed that the weapon was acceptable, but the Army chose not to adopt it formally. However, in 1896, the U.S. Army began limited procurement of the M1895 machine gun although it was not officially adopted. Some of the weapons saw use during the Spanish-American War where they proved to be of value. In 1897, the U.S. Navy also acquired fifty M1895 Colt machine guns chambered for its standard 6mm cartridge as used with the M1895 Lee Navy rifle. A couple of the 6mm M1895 Colt machine guns were used by U.S. Marines defending the International Legation during the "Boxer Rebellion" of 1900. Many European and South American countries acquired M1895 Colt machine guns in various calibers. The British used the weapon during the Boer Wars, and it saw combat on all sides during the Mexican Revolution. Some were also fielded by the American Punitive Expedition to Mexico in 1916.

In 1904, the .30-40 caliber M1895 machine guns were rechambered for the then-standard M1903 (".30-03") cartridge. The weapon was then re-designated as the "Model of 1902." During the same period, the Army tested the Maxim machine gun (to be discussed shortly). The major problem encountered with the Colt machine gun was that the weapon was air cooled, thus not capable of sustained fire as were water-cooled machine guns.

After adoption of the M1906 cartridge (".30-06"), the M1902 machine guns were rechambered for the new round and re-designated as the "Model of 1906." In addition to the converted weapons, some new machine guns of this pattern were procured.

M1914 Colt Machine Gun

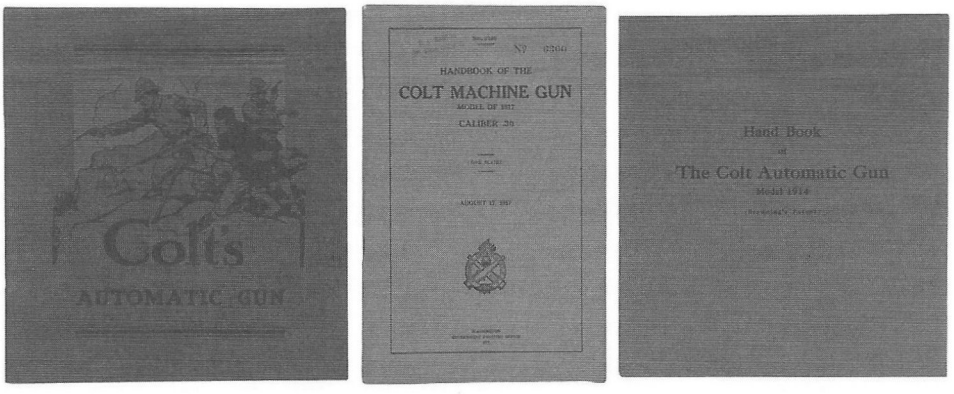
In 1914, Colt modified the design of the M1895 machine gun to incorporate a finned barrel that, unlike the original pattern, was easily removable. This allowed overheated or shot-out barrels to be readily replaced. An asbestos glove was issued to assist in changing hot barrels. Otherwise, the new model was essentially the same as the original M1895 machine gun.

The M1914 Colt machine gun weighed 35 pounds. The tripod added another 56 pounds. Three types of tripods were utilized with the weapon; the original M1895 pattern (high profile), the M1915

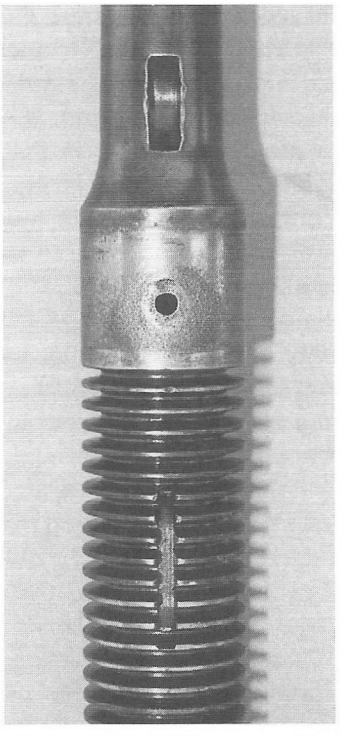
U.S. soldier changing barrel on a M1914 machine gun. The most notable difference between the original M1895 machine gun and the improved M1914 variant was the ability to change barrels quickly. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

(intermediate height) and the M1917 (low profile). Most tripods were fitted with a small seat for the gunner. The gun fired at a cyclical rate of between 400 and 450 rounds per minute and fed from a canvas belt holding 250 rounds. A loaded belt weighed some 15 pounds. The weapon was air cooled aided by radiating fins on the outside of the barrel. In 1916, the Russian government contracted with the Marlin-Rockwell Corporation of New Haven, Connecticut, to produce the M1914 machine gun chambered for the 7.62mm Russian cartridge. The peak production of the M1914 Colt machine gun by Marlin-Rockwell was 200 guns daily by the end of 1916.

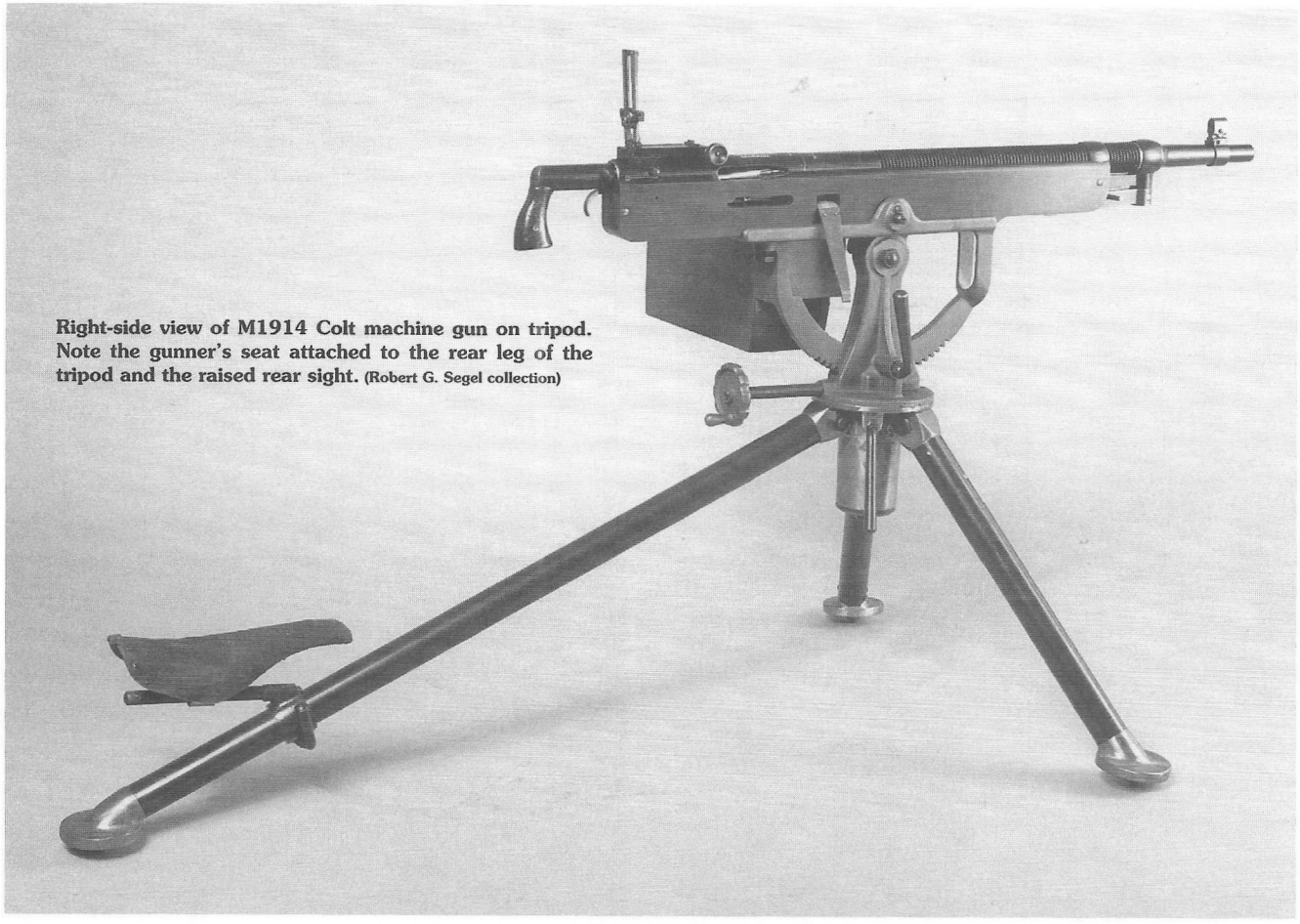
At the time of America's entrance into the First World War, there were only



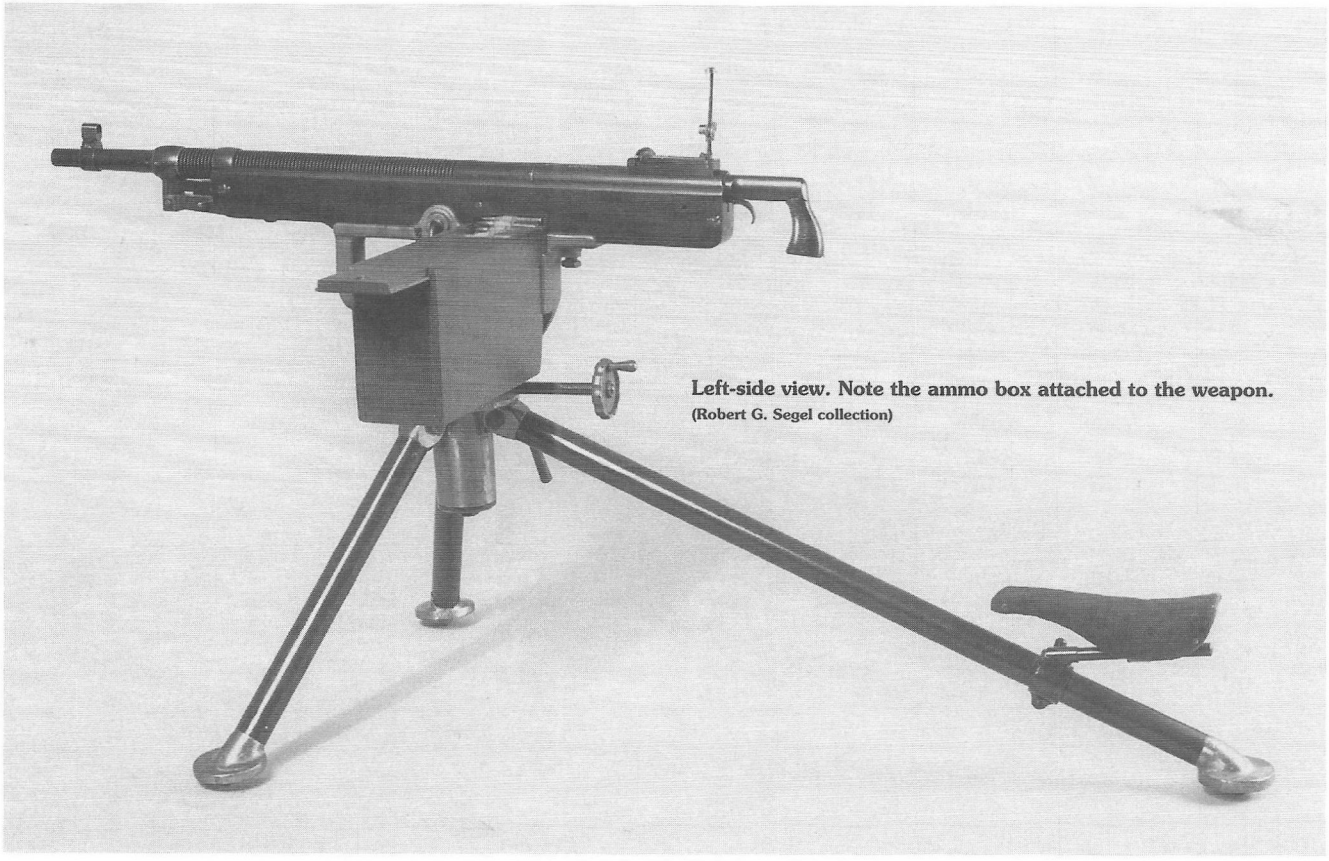
M1914 Colt machine gun manuals. (Robert G. Segel collection)



Close-up of barrel showing cooling fins, gas port and barrel wrench slot. (Robert G. Segel collection)

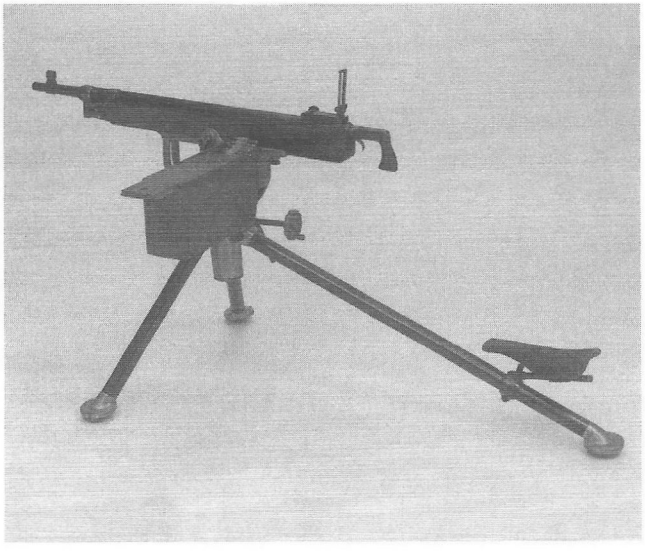


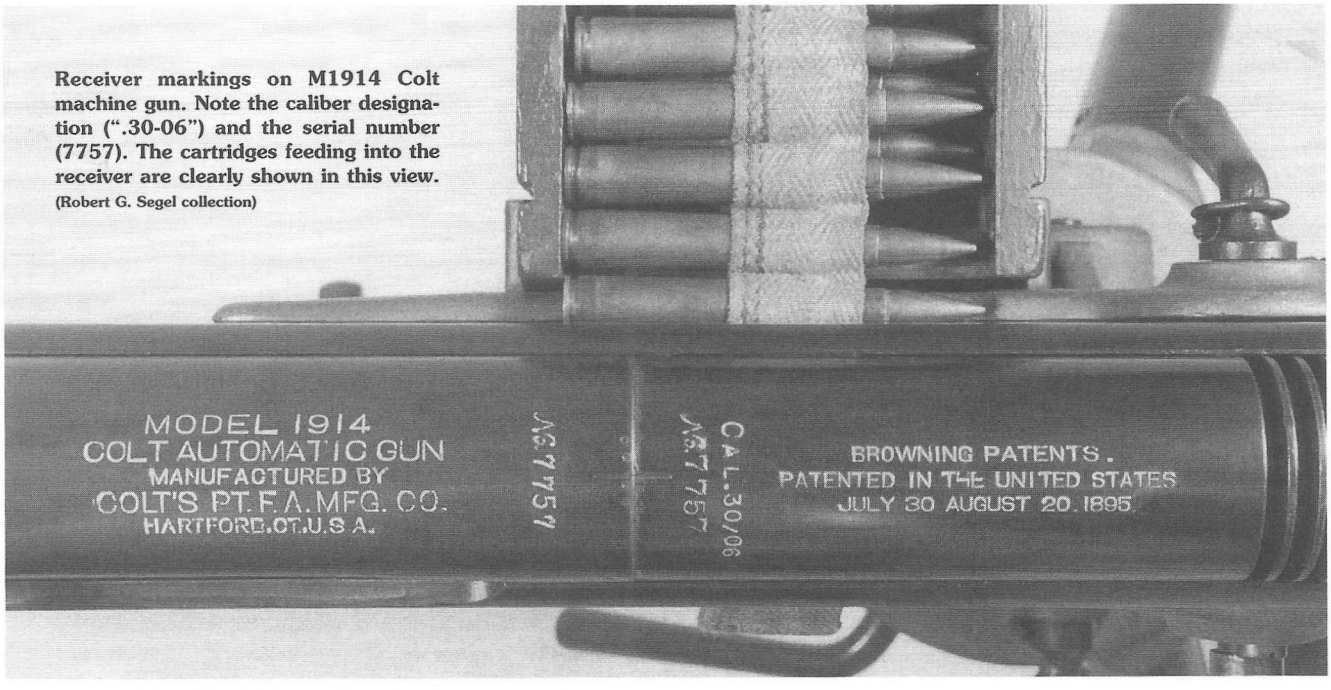
Right-side view of M1914 Colt machine gun on tripod. Note the gunner's seat attached to the rear leg of the tripod and the raised rear sight. (Robert G. Segel collection)



Left-side view. Note the ammo box attached to the weapon. (Robert G. Segel collection)

Four alternate views of M1914 Colt machine gun.
(Robert G. Segel collection)



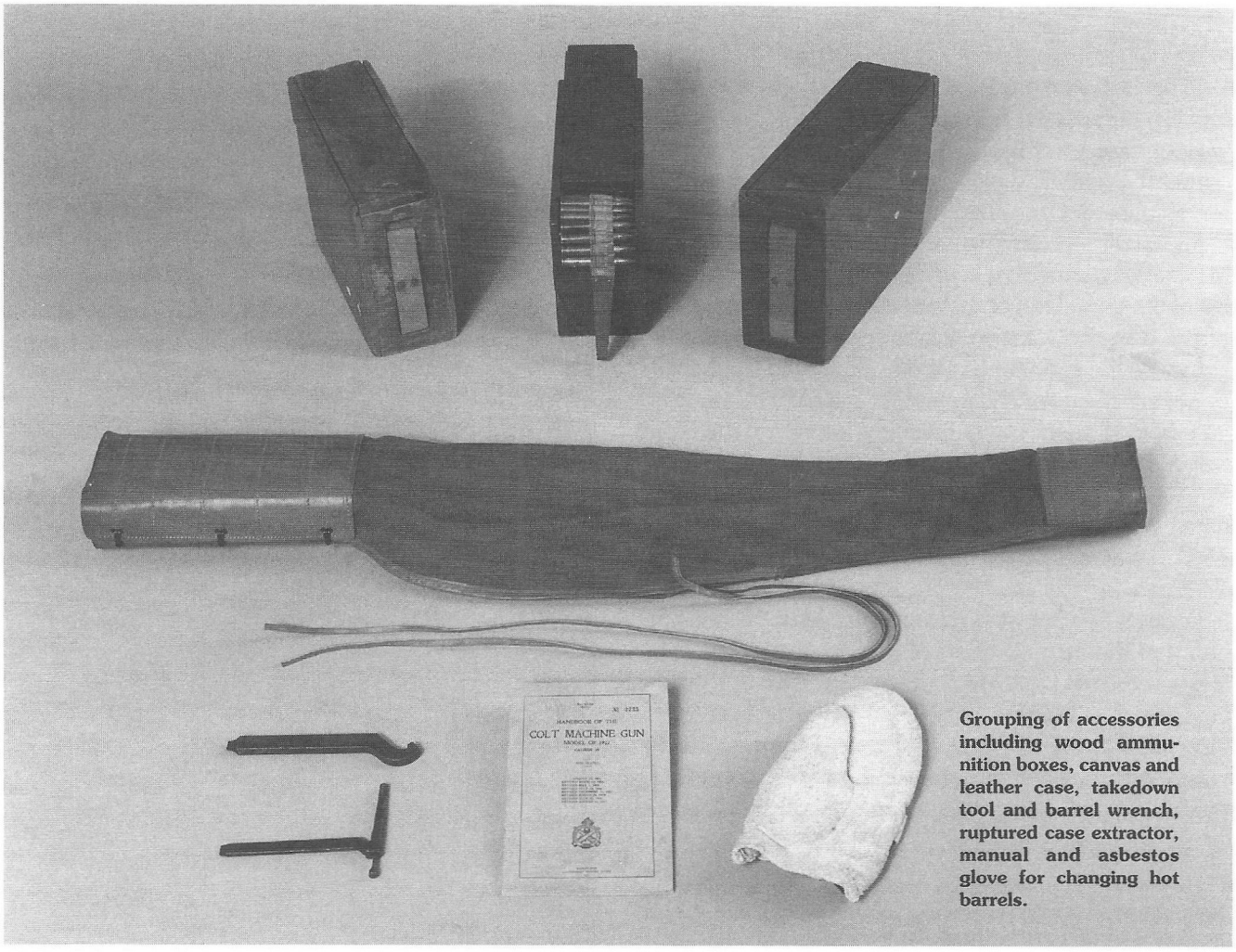


Receiver markings on M1914 Colt machine gun. Note the caliber designation (".30-06") and the serial number (7757). The cartridges feeding into the receiver are clearly shown in this view.
(Robert G. Segel collection)

View of M1914 machine gun rear area including grip, trigger and raised rear sight. Note the adjustment knob attached to the tripod mechanism.
(Robert G. Segel collection)

148 M1914 Colt machine guns on hand in Uncle Sam's inventory. Some of the 7.62mm guns originally made for the Russians, but not shipped due to the Bolshevik Revolution, were acquired by the United States and rechambered for the .30-06 cartridge. The machine guns modified to .30 caliber were referred to, in many government reports and ordnance documents of the First World War period, as the "Model of 1917 Colt Machine Gun" However, it is not certain that this was the official nomenclature of this weapon. The official 1917-dated manual designated the weapon as the "Colt Automatic Machine Gun, Caliber .30" and makes no reference to any model year. In any event, to prevent confusion with the later Browning water-cooled machine gun, the Colt gun (including the guns made by Marlin-Rockwell) will be referred to in this book as the "M1914," even though the WWI variants can properly be termed as the "Model of 1917."

The M1914 machine gun could be transported in the same type of machine gun cart (to be profiled later) as used with the Vickers machine gun (also to be discussed).



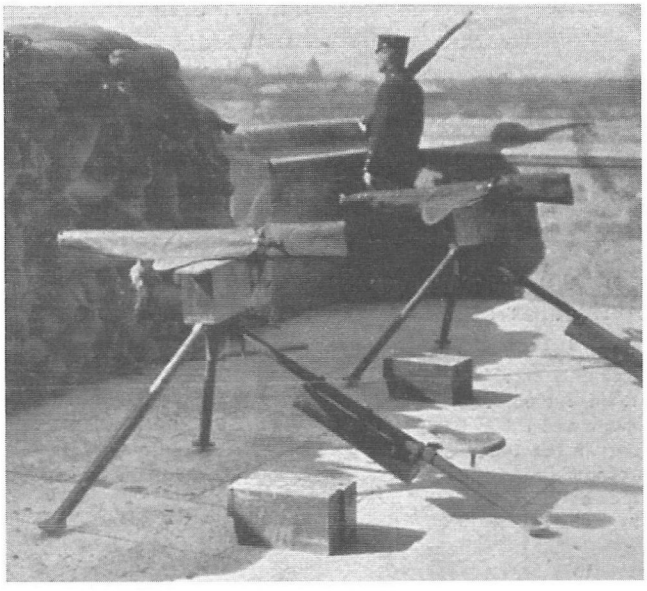
Grouping of accessories including wood ammunition boxes, canvas and leather case, takedown tool and barrel wrench, ruptured case extractor, manual and asbestos glove for changing hot barrels.

Barrel and muzzle of M1914 Colt machine gun. Note the configuration of the front sight and the cooling fins on the barrel. The operating handle is retracted in this view illustrates how it operates in an arc under the barrel. This led to the weapon's nickname of "potato digger." (Robert G. Segel collection)

U.S. Navy sailor sighting Colt machine gun on shipboard, c.1918. The weapon stayed in service with the U.S. Navy much longer than with the U.S. Army. (Robert G. Segel collection)

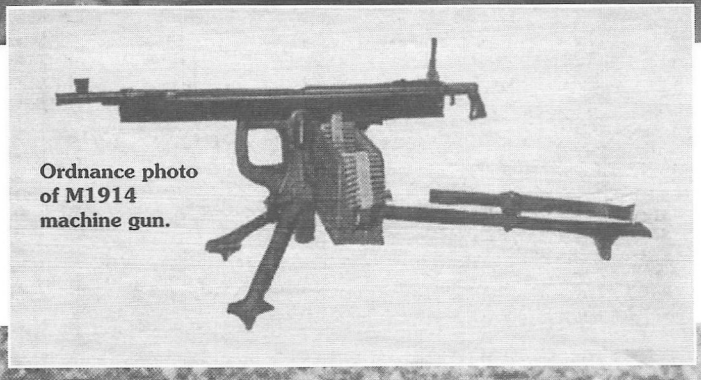
The U.S. Army used the M1914 machine gun for training purposes and supplemental use only, and the weapon was never fielded by the Doughboys in combat during the war. The U.S. Navy used the machine gun for shipboard duty during, and after, World War I. Compared to the later water-cooled machine guns, the M1914 was somewhat inefficient since it was not capable of the same level of sustained fire. Following the end of the war, the weapon was dropped out of use altogether by the U.S. Army. While not used in the trenches of France by American troops, the M1914 machine gun helped train many machine gunners who later helped make life miserable for our German adversaries.

A variation of the M1914 machine gun, designated as the "Marlin Aircraft Machine Gun, Model 1917," was developed and manufactured by Marlin-Rockwell for use on aircraft. The primary difference between it and the standard infantry M1914 machine gun was the incorporation of a reciprocating gas piston that moved in a straight line rather than the swinging lever. The relative light weight of the design and its easy adaptability to the aircraft's synchronizing mechanism were cited as reasons for the conversion of the machine gun to aerial use. A version of this weapon



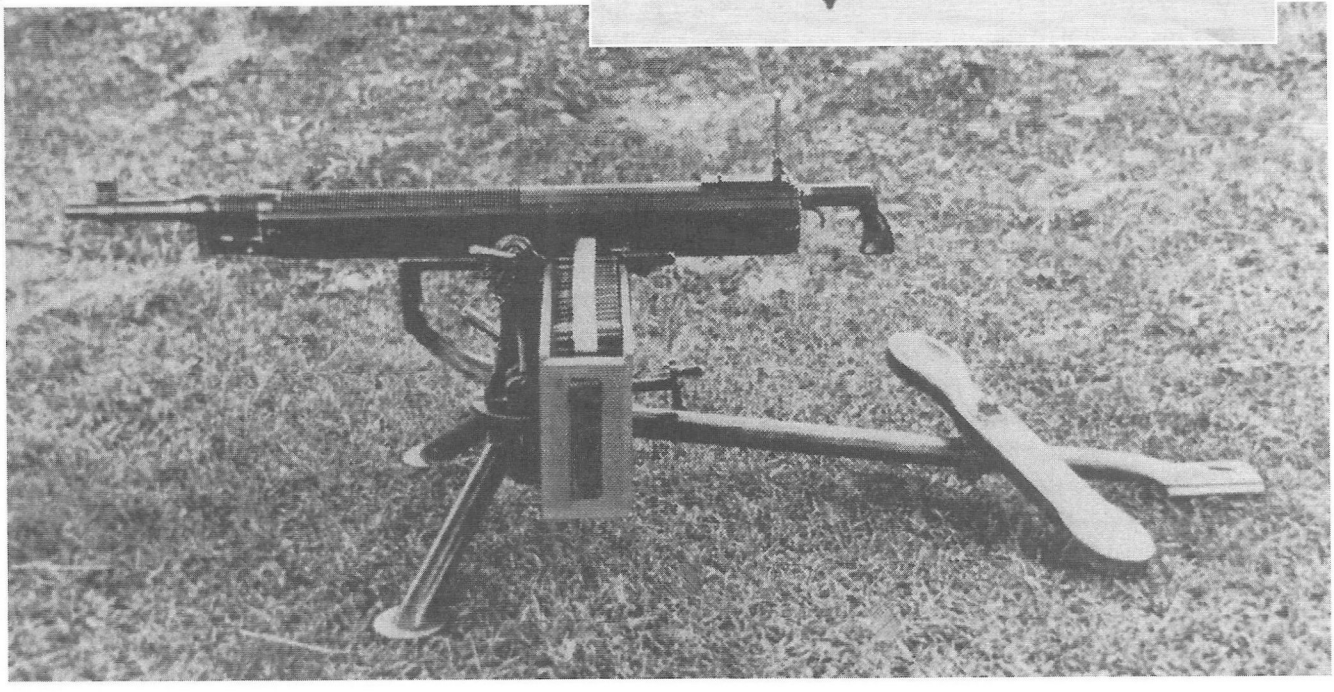
(right) Pre-WWI (1912) vintage photo depicting two M1895 Colt machine guns with protective covers in place.

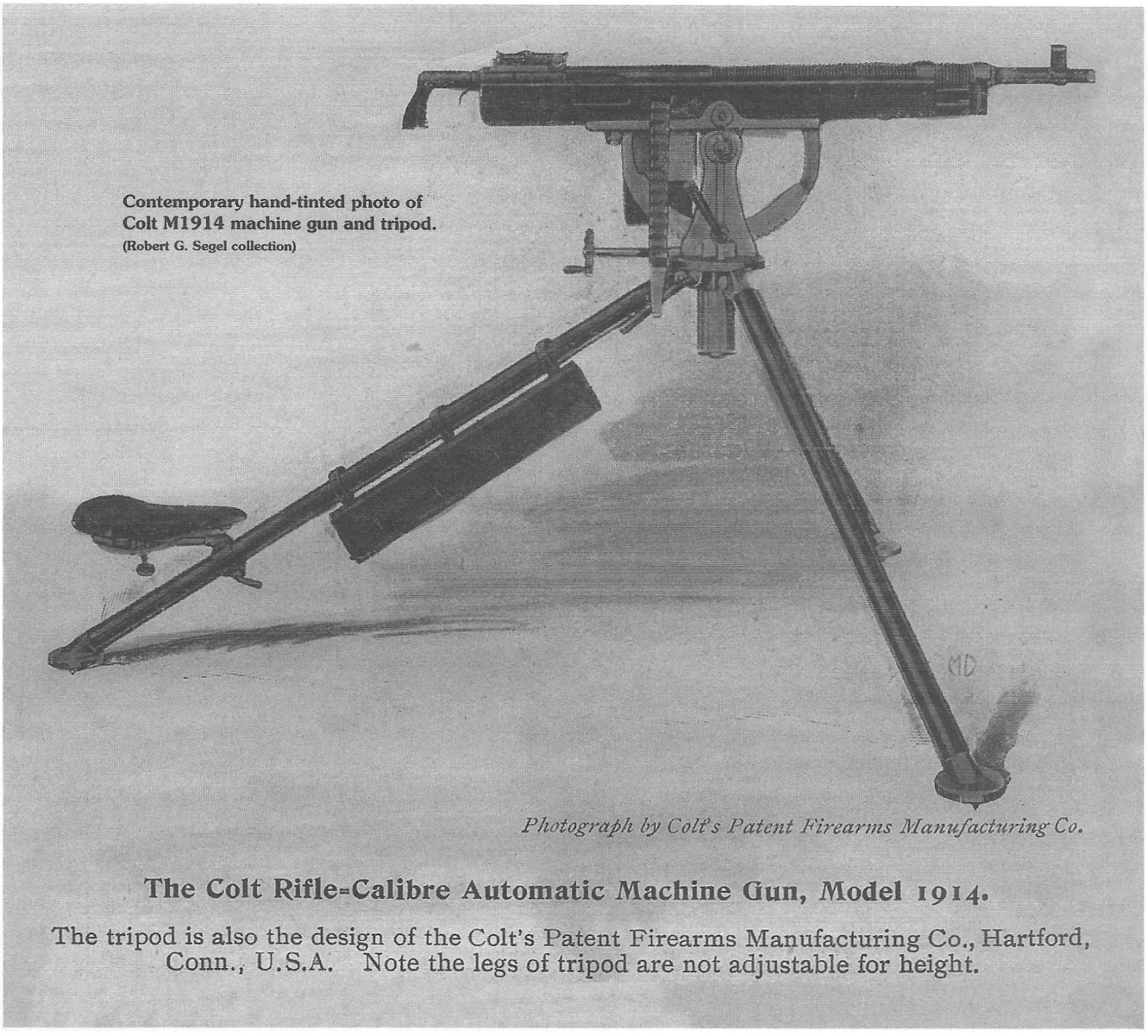
U.S. Doughboys training with M1914 machine gun.
(Robert G. Segel collection)



Ordnance photo of M1914 machine gun.

Colt M1914 machine gun.
(U.S. Army, courtesy Konrad F. Schreier, Jr.)





Contemporary hand-tinted photo of Colt M1914 machine gun and tripod.
(Robert G. Segel collection)

Photograph by Colt's Patent Firearms Manufacturing Co.

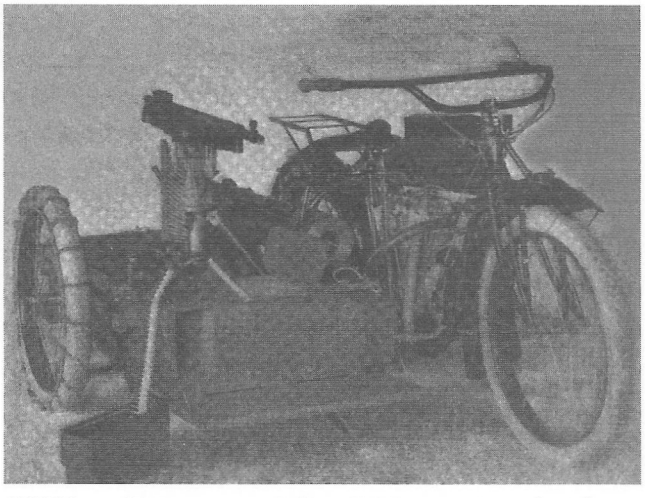
The Colt Rifle-Calibre Automatic Machine Gun, Model 1914.

The tripod is also the design of the Colt's Patent Firearms Manufacturing Co., Hartford, Conn., U.S.A. Note the legs of tripod are not adjustable for height.

was also made for use with tanks. Only the M1914 (a.k.a. "M1917") variant was intended for infantry use. It should be noted that even the examples made by Marlin-Rockwell were usually referred to collectively as the "Colt Machine Gun."

Despite its lack of combat use by Americans, some M1914 machine guns were procured by the Canadians early in the war and enjoyed some popularity as a combat weapon. The successful use of the Colt machine gun by the Canadians is discussed in the interesting book *A Rifleman Went to War* by Captain Herbert W. McBride. As related by McBride:

Never have I seen any machine gun that is as safe for shooting over the heads of advancing infantry as the Colt. In other words, it has less dispersion, vertically, than any gun I have seen... And



M1914 machine gun mounted on WWI-era motorcycle sidecar.
(Robert G. Segel collection)

by the way, lest I forget it, there is another good argument for the Colt gun, and that is that it is air cooled. Say what you want to, the business of getting water where there ain't any and keeping that old condenser and its hose and everything right with you and ready to hook up, when you are crawling through all the litter of a battlefield, it is not so easy. And how the water boils away!

As can be seen, the smooth operation of the "potato digger" and the air-cooled mechanism were advantages that are sometimes overlooked. While obsolescent by the time of the First World War, the Colt M1914 machine gun nevertheless did journeyman service in the hands of our allies, and provided valuable training experience to our fledging AEF machine gunners.

Model of 1904 U.S. Maxim Machine Gun

As mentioned, the United States Army tested an early version of this machine gun invented by an American arms designer, Hiram Stevens Maxim. Maxim was born in Maine but later moved to England and became a British subject and, eventually, he was knighted.

In 1888, the U.S. Army tested one of Maxim's early machine guns and, although it showed some promise, early design flaws surfaced and the weapon was deemed as "not acceptable." The black powder .45-70 cartridge also caused fouling problems which further reduced the weapon's dependability.

Maxim continued refining his design, and the weapon soon caught the interest of a number of nations. Germany, in particular, was an enthusiastic supporter of the Maxim gun and standardized the weapon as its first official heavy machine gun. The British also adopted the Maxim and used the weapon during the Boer War. The Maxim was manufactured in Great Britain by the Vickers Company.

In 1904, the United States adopted the latest version of the Maxim machine gun chambered for the then-standard M1903 (.30-03) cartridge. The primary advantage of the Maxim over the M1895 Colt machine gun then in service was the fact that the weapon was water cooled, which made it capable of sustained fire. When the improved M1906 (.30-06) cartridge was standardized by the United States

Right-side view of U.S. Colt M1904 Maxim machine gun and tripod.
(Robert G. Segel collection)

Four alternate views of U.S. Colt M1904 Maxim machine gun.
(Robert G. Segel collection)

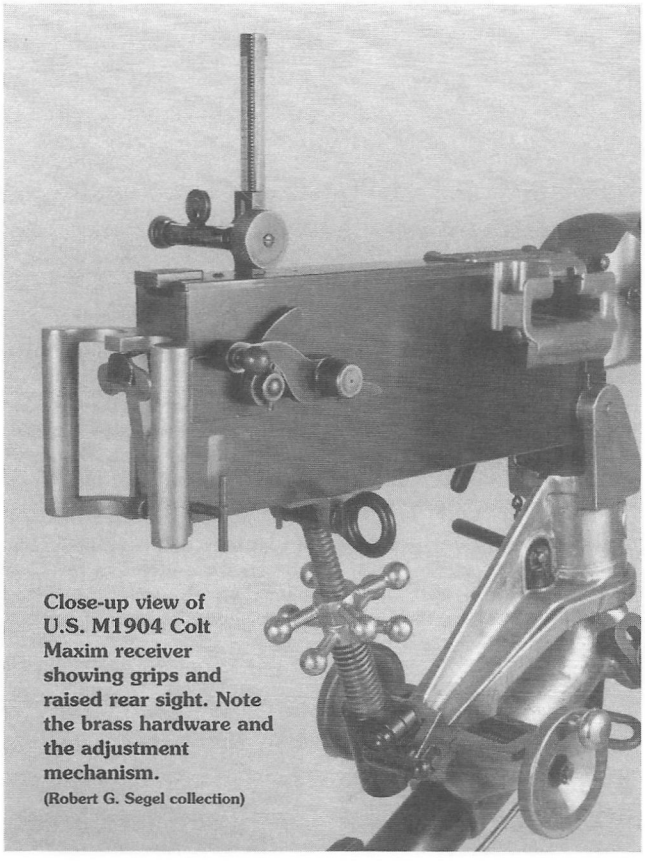
military, the M1904 Maxim machine guns in inventory were rechambered for the new round.

The M1904 Maxim machine gun weighed 61.5 pounds with an empty water jacket and 74.5 pounds with the water jacket filled (13-pint capacity). The tripod weighed approximately 78 pounds. The gun was 44.2" in overall length with a 26" barrel. The weapon fired automatically at a cyclical rate of 450 rounds per minute from a web cartridge belt holding 250 rounds. The rear sight was graduated up to 2,000 yards with 100 yard increments. The Maxim was a heavy weapon since the gun and tripod weighed over 150 pounds. It was also a complex weapon and required the utmost in gun-making and maintenance skills.

The M1904 Maxim machine guns were fitted with muzzle boosters that utilized energy from the muzzle blast to assist in operating the mechanism. Despite their appearance, the muzzle boosters were not flash hiders.

Unlike most other water-cooled heavy machine guns, the M1904 Maxim did not have a steam condensing hose. The weapon was fitted with a steam vent hole, but there was no provision to attach a hose. When the weapon was originally adopted, little consideration was given to the fact that escaping steam could enable an enemy to more easily spot a concealed machine gun. This tactical oversight was undoubtedly due to the fact that machine guns were originally considered to be fixed defensive weapons in the same general category as artillery.

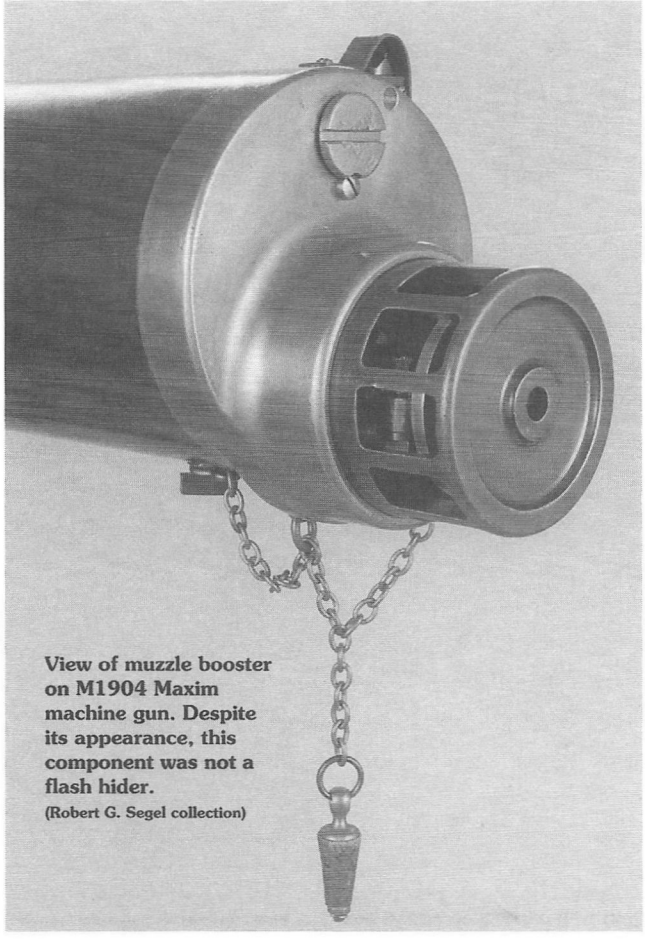
There were 287 M1904 Maxim machine guns procured by the United States and on hand at the time of America's declaration of war. The first 90 guns were manufactured in England by the firm of Vickers Sons & Maxim (VS&M), and the remaining 197 were manufactured in the United States by the Colt's Patent Firearms Manufacturing Company of New Haven, Connecticut. The Colt-made guns were very attractive weapons with



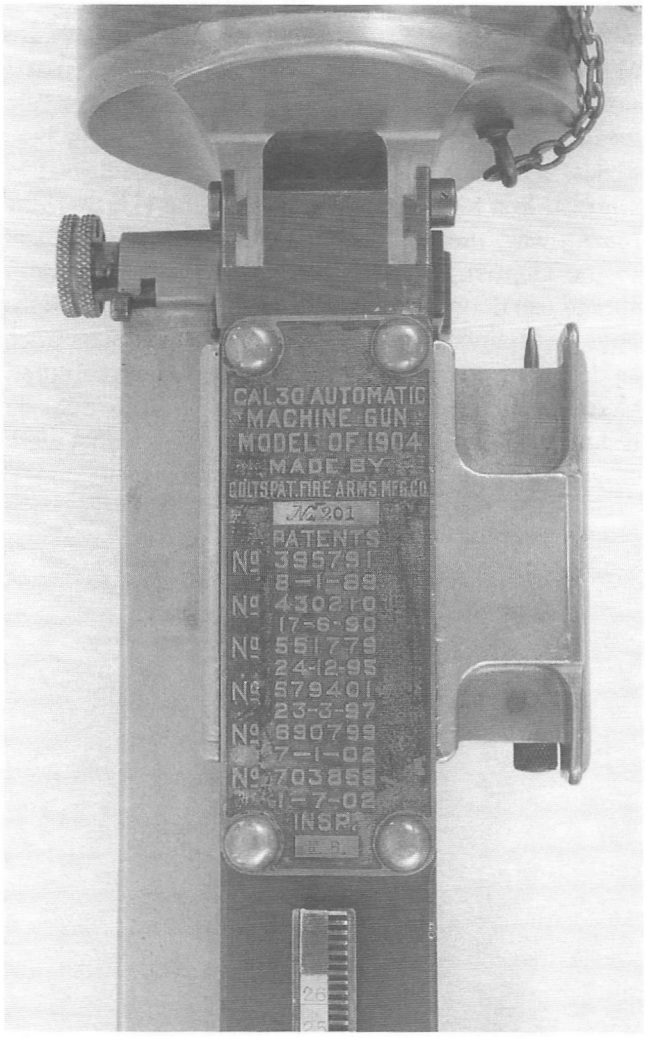
Close-up view of U.S. M1904 Colt Maxim receiver showing grips and raised rear sight. Note the brass hardware and the adjustment mechanism.
(Robert G. Segel collection)

World War I vintage photo of U.S. soldier firing a M1904 Maxim machine gun. Note the revolver on his right hip.
(U.S. Army, courtesy Konrad F. Schreier, Jr.)

Data plate on Colt-made M1904 Maxim machine gun. Note the patent dates, serial number 201 and inspector initials "F.B." for Col. Frank Baker. This gun was the 111th M1904 Maxim made by Colt and was delivered to the government on October 9, 1908.
(Robert G. Segel collection)



View of muzzle booster on M1904 Maxim machine gun. Despite its appearance, this component was not a flash hider.
(Robert G. Segel collection)

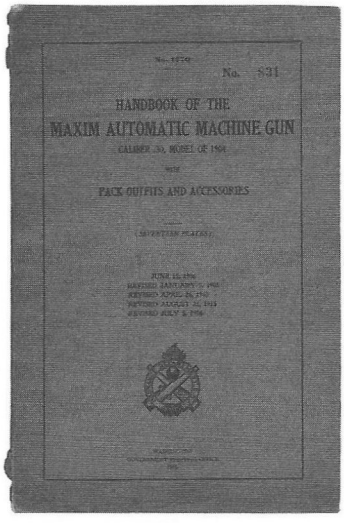


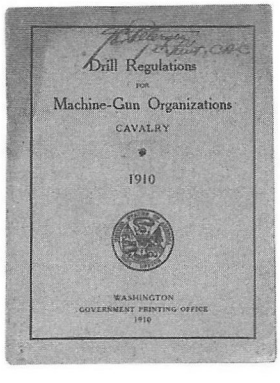
finely blued receivers and brass/bronze fittings. The M1904 Maxim machine guns were fitted with well-made tripods. All tripods were made by VS&M, since it was determined that this firm could produce the items cheaper than Colt could tool up to manufacture tripods. The tripods were inspected by U.S. Army ordnance personnel prior to acceptance into service.

The water boxes and ammo boxes used with the M1904 Maxim machine guns were identical to the type used with the later M1915 Colt Vickers machine guns except for the fact that the M1904 boxes had metal handles while the M1915 boxes were equipped with leather handles.

Although only a seemingly small number of M1904 Maxim machine guns was procured by the U.S. Army, the number was deemed sufficient at the time. This speaks volumes about the mindset of the military establishment of the day regarding machine guns. Many high-ranking officers were of the opinion that machine guns were, at best, marginally useful infantry weapons. Subsequent events soon proved this opinion to be dreadfully wrong.

At the time of the America's active involvement in WWI, the M1904 Maxim machine gun, along with the M1909 Benét-Mercie "machine rifle" (to be discussed next) were the co-standard U.S. Army automatic weapons. These arms were utilized for training purposes, and none are believed to have been fielded in combat. It is interesting to note that the U.S. M1904 Maxim was, mechanically speaking, virtually identical to the German Maxim machine gun that saw widespread use during the war. The fact that many Doughboys had trained with U.S. Maxim machine guns prior to deploying to France enabled them to use captured German Maxims quite efficiently. The AEF actually tested some captured 8mm German Maxims that were converted to U.S. .30 caliber.

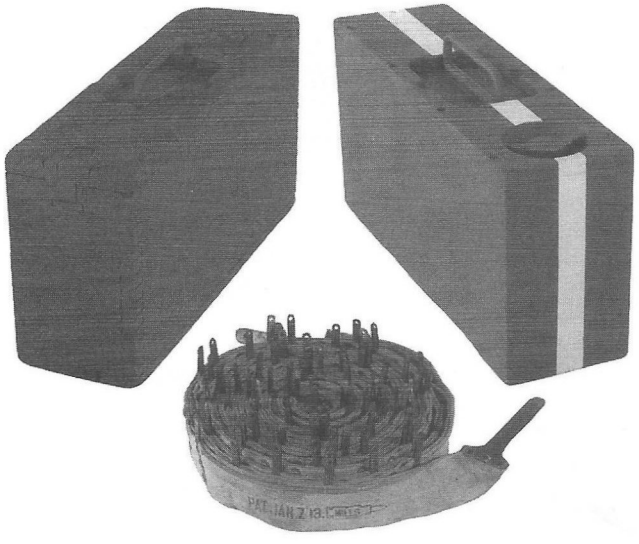


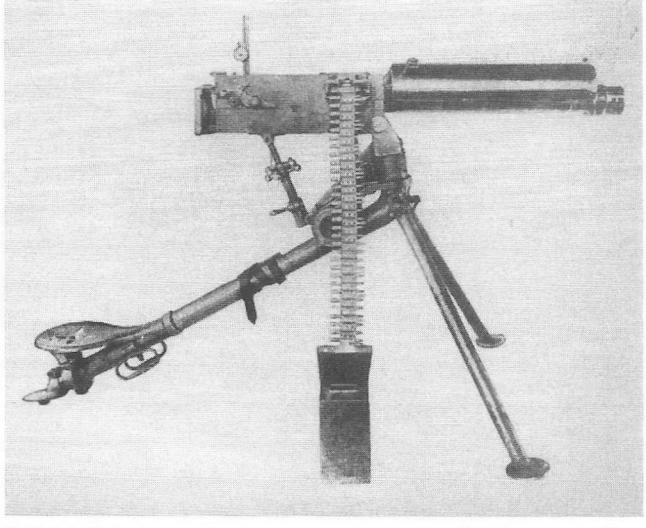


Manuals used with U.S. M1904 Maxim machine gun. (Robert G. Segel collection)

(above) Data plate on tripod furnished with Colt M1904 Maxim machine guns. All U.S. Colt Maxim tripods were made by the British firm of Vickers Sons & Maxim (VS&M). Note the serial number, 69, and the inspector's initials, "W.S.P" for Maj. W.S. Pierce of Springfield Armory. (Robert G. Segel collection)

(below) Water box, ammo box and cartridge belt used with U.S. M1904 Maxim machine gun. The boxes were identical to those used with the U.S. M1915 Vickers machine gun except they had metal handles while the Vickers water and ammo boxes utilized leather handles. (Robert G. Segel collection)





Official U.S. Army photograph of M1904 Colt Maxim machine gun with tripod and ammo box. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

Photo of M1904 Maxim pack outfit. This photo was undoubtedly taken during the 1916 Punitive Expedition to Mexico.
(U.S. Army, courtesy Konrad F. Schreier, Jr.)

Like the M1914 Colt machine gun, the M1904 U.S. Maxim provided valuable training experience to our fledging machine gunners who would soon deploy to the front lines of France. To some people, the Maxim machine gun is thought of as exclusively a German weapon, and they are not aware that the United States adopted the weapon prior to the First World War. Today, the M1904 Maxim machine gun is a little-known, but quite interesting, American military weapon.

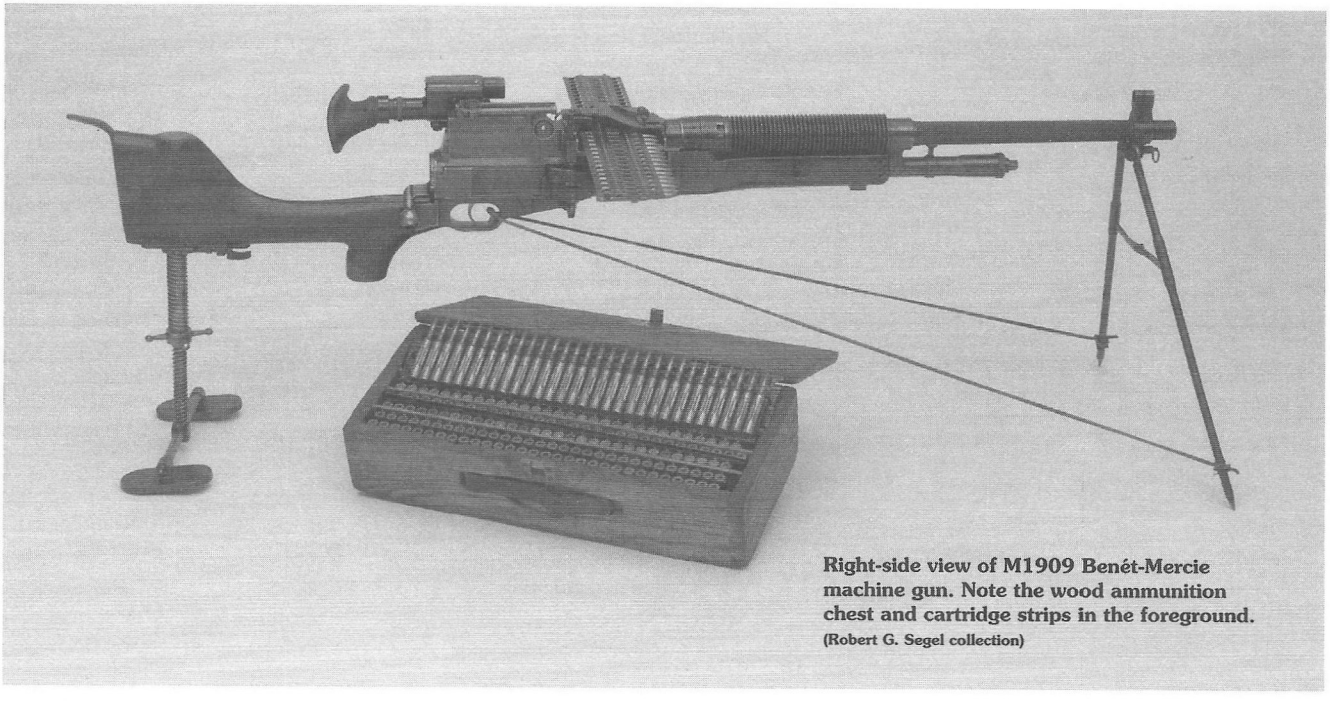
Model of 1909 Benét-Mercie Machine Rifle

In 1909, the United States adopted an automatic weapon based on a design perfected and refined by the Hotchkiss Company. The "Model of 1909 Benét-Mercie Machine Rifle," chambered for the M1906 (.30-06) cartridge, was intended to be a relatively portable automatic weapon for infantry and cavalry use. The weapon was gas operated and fired at the rate of approximately 400 rounds per minute with a muzzle velocity of some 2,400 f.p.s. The cartridges fed into the weapon by means of metal strips holding 30 rounds. Ten loaded strips (300 rounds) were carried in a wooden ammunition box. The M1909 Benét-Mercie was 48½" in overall length with a 25.1" barrel. The weapon weighed about 30 pounds, which was much lighter than a traditional heavy machine gun but substantially more than a typical automatic rifle. The Benét-Mercie utilized interchangeable barrels to help boost the weapon's sustained fire capability. While this was a step in the right direction, such a weapon could never achieve the sustained fire capability of a water-cooled machine gun.

The M1909 Benét-Mercie was equipped with the M1908 Warner & Swasey telescopic "musket sight" as used on early M1903 Springfield sniper rifles. It was believed that the telescopic sights would enable

machine gunners to acquire targets more easily and observe the effectiveness of fire.

The M1909 was manufactured by the Colt's Patent Firearms Manufacturing Company and the government's Springfield Armory. The two entities produced a combined total of 670 M1909 Benét-Mercie machine guns. The weapon's baptism of fire occurred during the 1916 Mexican campaign. While the gun was of value on some occasions, it proved to be difficult to assemble, particularly in the dark. Also, the feed strips could be inserted upside down while loading in the dark. The gun was also unreliable on many occasions due to its propensity to break parts, primarily firing pins and extractors. The problems of loading and disassembling the guns in the dark resulted in the Benét-Mercie being derisively dubbed the "daylight gun," since some people felt it was not useable at night. Some of the problems encountered with these weapons in Mexico were undoubtedly due to inadequate training and general unfamiliarity with the arm. Ultimately, the M1909

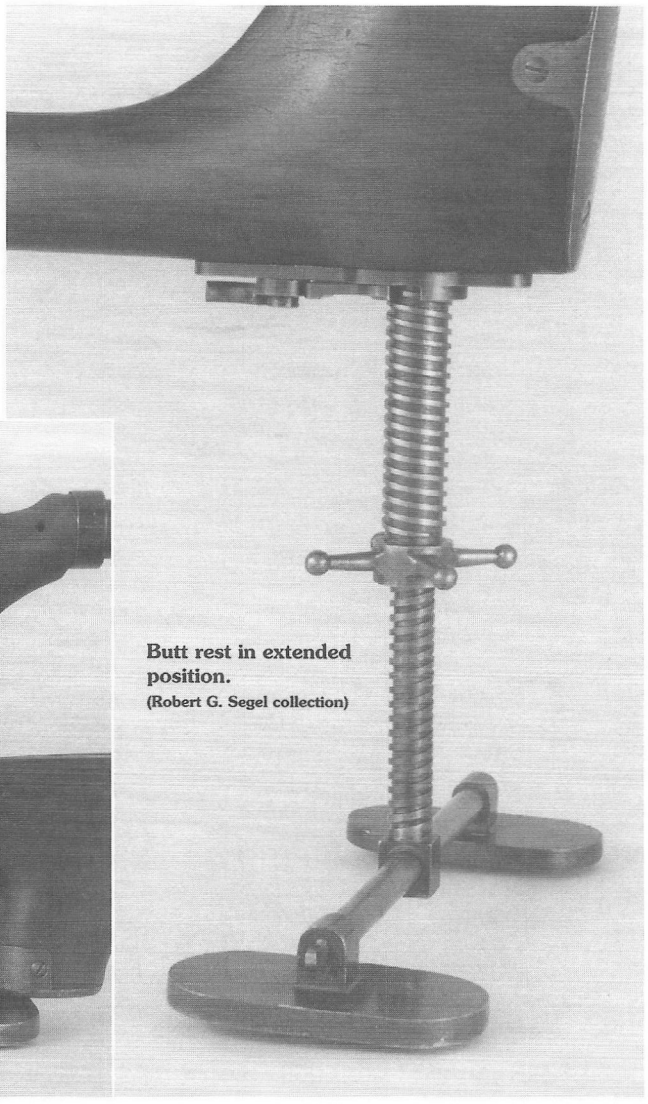


Right-side view of M1909 Benét-Mercie machine gun. Note the wood ammunition chest and cartridge strips in the foreground.
(Robert G. Segel collection)

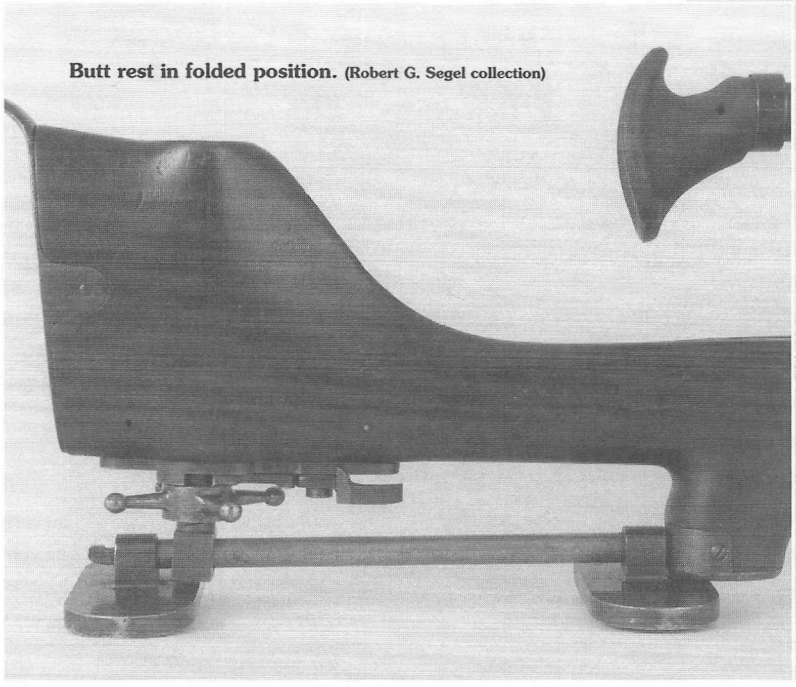
Left-side view. Note the M1908 Warner & Swasey telescopic "musket sight."
(Robert G. Segel collection)

Benét-Mercie acquitted itself fairly well, although it was clearly far from a perfect gun.

As stated, at the time of America's entrance into the war, the M1909 Benét-Mercie and the M1904 Maxim were the standard automatic weapons in U.S. service. The first U.S. Army machine gun units that deployed to France carried their M1909 Benét-Mercie weapons along. Although they were employed in France for training use, none are believed to have been utilized for combat purposes. It was fortunate that the Doughboys

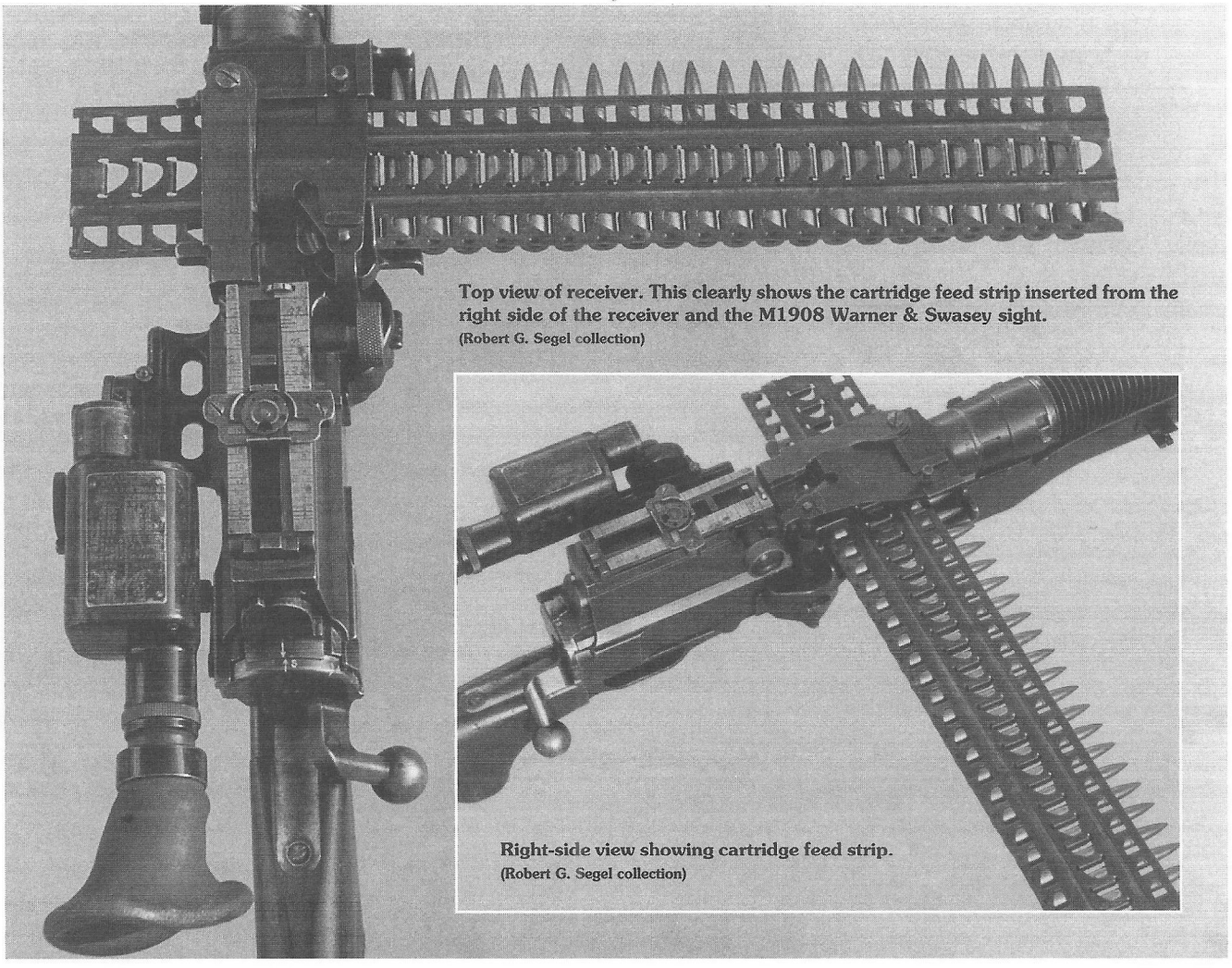


Butt rest in extended position. (Robert G. Segel collection)



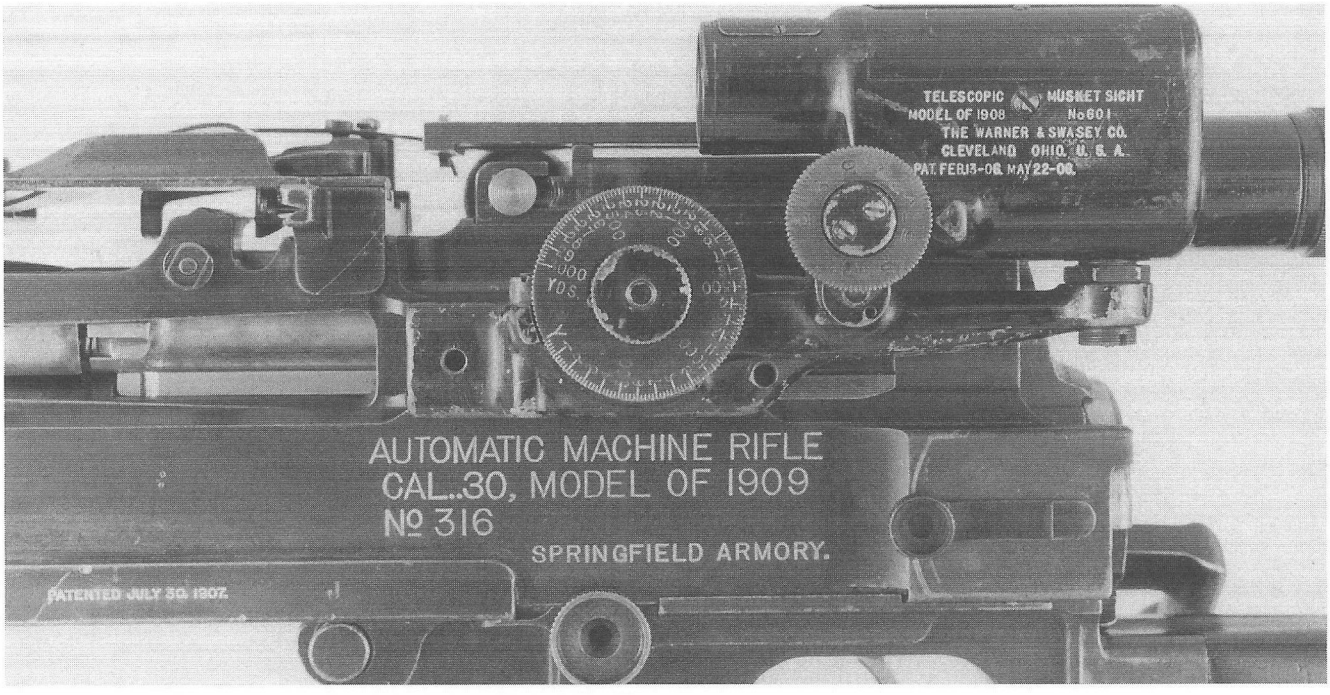
Butt rest in folded position. (Robert G. Segel collection)

View of disassembled weapon. Note there are only 25 components to this weapon. (Robert G. Segel collection)



Top view of receiver. This clearly shows the cartridge feed strip inserted from the right side of the receiver and the M1908 Warner & Swasey sight. (Robert G. Segel collection)

Right-side view showing cartridge feed strip. (Robert G. Segel collection)

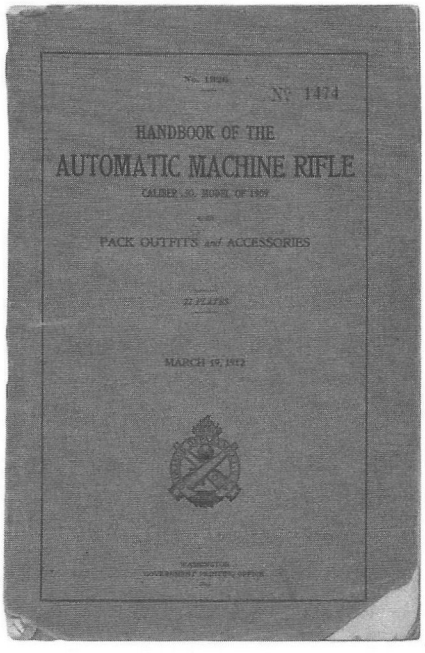


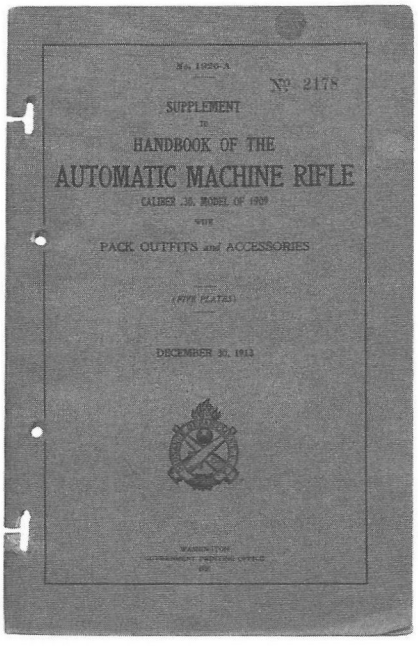
Left side of receiver. Note the markings indicating production by Springfield Armory and the serial number (316). The markings on the M1908 W&S sight and the windage and elevation adjustment knobs are also shown in this view. (Robert G. Segel collection)

did not have to rely on the Benét-Mercie guns in combat against the Germans due to the weapon's reliability problems. The noted arms authority of the day, Edward C. Crossman, related the following:

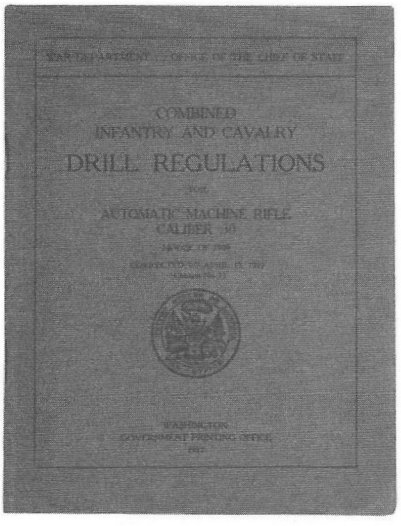
I remember one cold day how a government inspector and I lugged one of the government Benét-Mercie machine guns out of the great Colt factory where they were then made and set it up in the testing yard. Although the gun was in the hands of a most skilled man, a man there on purpose to inspect machine guns — that gun broke six parts in the first 20 shots. It broke extractors and firing pins as fast as we could put them in — because the weather was cold, and the chilled parts

U.S. Army troops on the Mexican border with M1909 Benét-Mercie, circa 1916.
(U.S. Army, courtesy Konrad F. Schreier, Jr.)





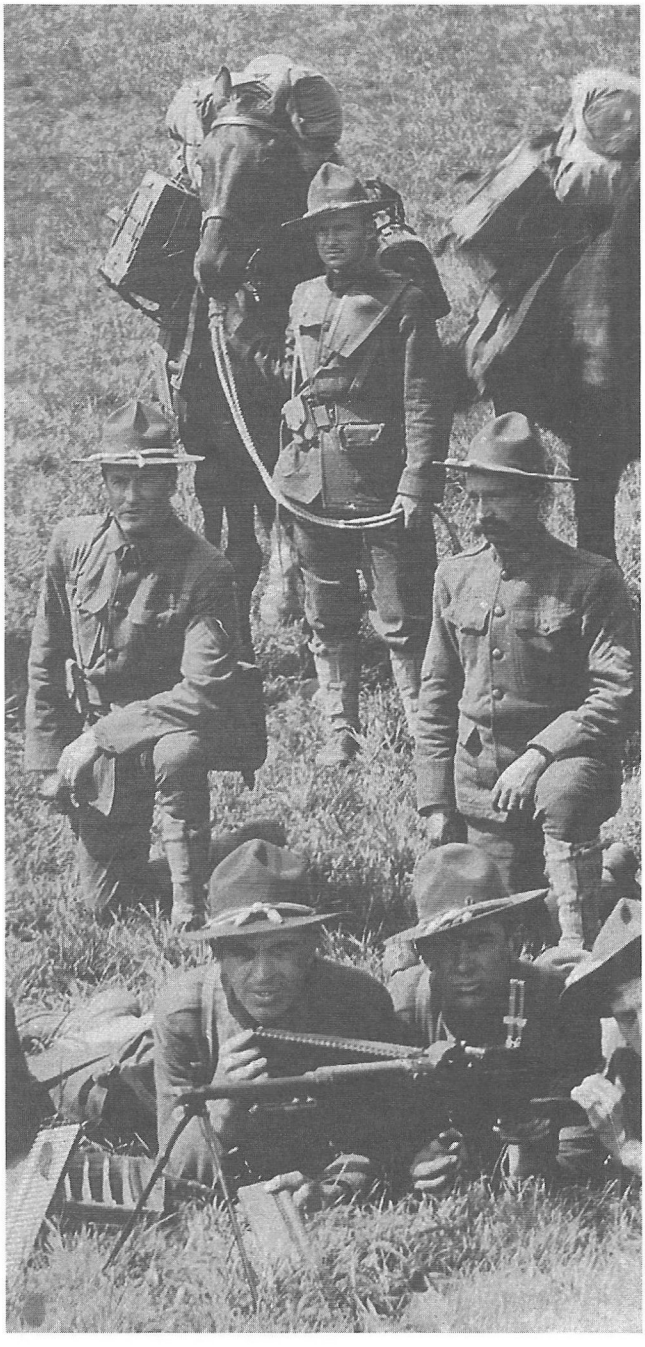
M1909 Benét-Mercie machine gun manuals. **(Robert G. Segel collection)**

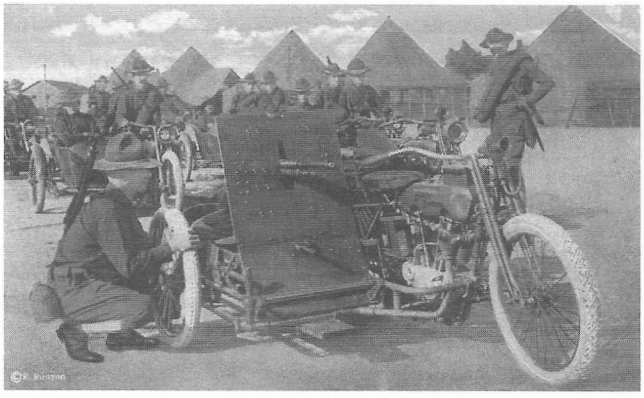


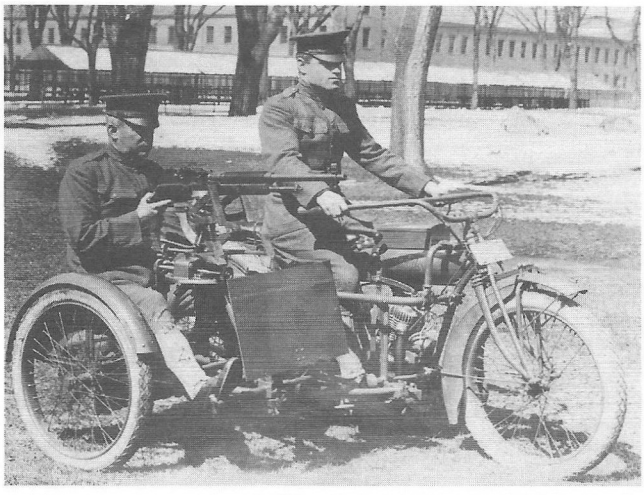
were brittle. Imagine tumbling out in the chill dawn of a winter's day with the Huns coming over No Man's Land, and having your machine gun break apart the first rattle of shots!

The Doughboy's Benét-Mercie guns were replaced by other weapons such as the French Hotchkiss and British (or American) Vickers guns as they became available. The M1909 Benét-Mercie dropped from the U.S. arsenal before the end of the war, and most of the weapons were destroyed or discarded.

U.S. troops in Mexico with M1909 Benét-Mercie. Note the pack horses in the background. (Dean Trimble)







(above) Various views of M1909 Benét-Mercie mounted on motorcycle sidecars. (Robert G. Segel collection)

(below) Test firing the M1909 Benét-Mercie. (Donald Blake Webster)

Although its only combat use was in the 1916 Mexican campaign, many "rookie" Doughboy machine gunners honed their skills on the Benét-Mercie automatic weapons before graduating to heavy machine guns. While it was a flawed weapon, the M1909 Benét-Mercie nevertheless was an important weapon to the United States military for a brief period of time. It filled a niche that was soon occupied by more modern automatic arms. While sometimes overlooked when considering the weapons of WWI, the U.S. Benét-Mercie machine rifle remains an interesting, if anachronistic, weapon.

Lewis Light Machine Gun

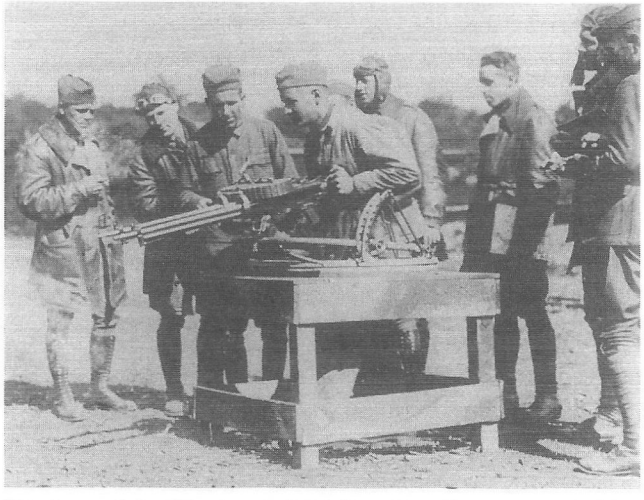
One of the more interesting automatic weapons to have seen use during the First World War was the Lewis gun. The weapon does not fall neatly into any single category and has been variously referred to as an automatic rifle, light machine gun and machine gun. One contemporary writer attempted to cover all the bases and classified the weapon as a "light automatic machine rifle."

Development of the Lewis gun began in 1910 when U.S. Army Colonel Isaac N. Lewis was charged with perfecting a machine gun initially developed by

Left-side, full-length view of Lewis gun made by Savage Arms. This example is .303 caliber and was made under contract in the United States for the Canadian government. Externally the .303 and .30-06 Lewis guns were virtually indistinguishable. (Robert G. Segel collection)

Right-side view of Lewis gun. (Robert G. Segel collection)

an American inventor, Samuel McClean. The original gun designed by McClean was rejected by the military after a cursory glance. McClean's financial backers recruited the services of Col. Lewis, and the talented arms engineer was able to redesign the original weapon and vastly improve its performance. A prototype was tested in 1911, which showed a great deal of promise. The Ordnance Department scheduled a formal trial of the weapon for the summer of 1912. In an attempt to "hype" the testing of his weapon, Lewis arranged for the gun to be fired from a Wright biplane to introduce the weapon to the Ordnance Department "brass" assembled. This was the first time in history that a machine gun was fired from an aircraft. While undoubtedly dramatic, Lewis' idea backfired, as the Ordnance Board took a dim view of the stunt. The senior officers were of the firm opinion that firing a machine gun from an aircraft was a foolish endeavor and would never have any practical value. This apparently set the tone for the remainder of the trials and much fault, some real but most perceived, was found with the Lewis gun. The gun showed too much promise to reject out of hand, but the prejudice against the weapon was apparently such that it was not recommended for adoption. Lewis had fabricated several prototypes of his weapon for the trials chambered for the M1906 (.30-06) cartridge.



Members of the U.S. Army's 96th Aero Squadron testing double-mounted Lewis guns for aircraft use in France. Photo dated July 29, 1918. Many Lewis guns were modified and transferred to the Air Service after being withdrawn from infantry use. (National Archives)

Col. Lewis was incensed by the heavy handed tactics of the Ordnance Department and reportedly referred to the members of the board as "...ignorant hacks." While never stated, it is entirely possible that some army officers senior to Col. Lewis were jealous that a colleague might be fortunate enough to develop a weapon that could ultimately lead to fame and fortune. The official explanation behind the Army's refusal to adopt the Lewis gun was that it served essentially the same purpose as the M1909 Benét-Mercie and thus was not needed. Also, budgetary constraints were cited. In any event, Col. Lewis was embittered by the process and retired from the Army not long after the ill-fated initial trial of his machine gun.

In early 1913, Lewis took the remaining four .30-06 prototypes of his gun to Europe where the weapon was tested by several governments. The clouds of war were gathering over the continent at the time and there was much interest in new automatic weapons. The British were very taken with the Lewis gun and adopted the weapon chambered for their standard .303 cartridge. The Belgians also were enthusiastic about the Lewis gun and standardized the weapon as well. The new weapon was in full production by June of 1914 at the Birmingham Small Arms plant in England and at the Belgian arms factory at Liege. The weapon was

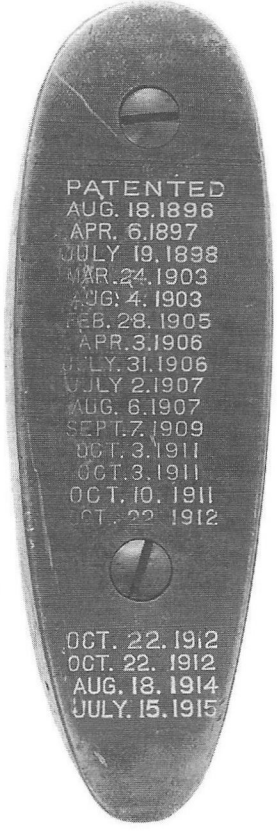
U.S. Army troops of the 29th Division training with Lewis guns at Camp McClellan, Alabama. Original caption reads "An Automatic Gun Section Advancing with Guns." (U.S. Army Military History Institute)

Excellent view of breech area of Lewis gun. Note the radiating (cooling) fins forward of the receiver area. The pistol grip and trigger and clearly shown in this view. (Robert G. Segel collection)

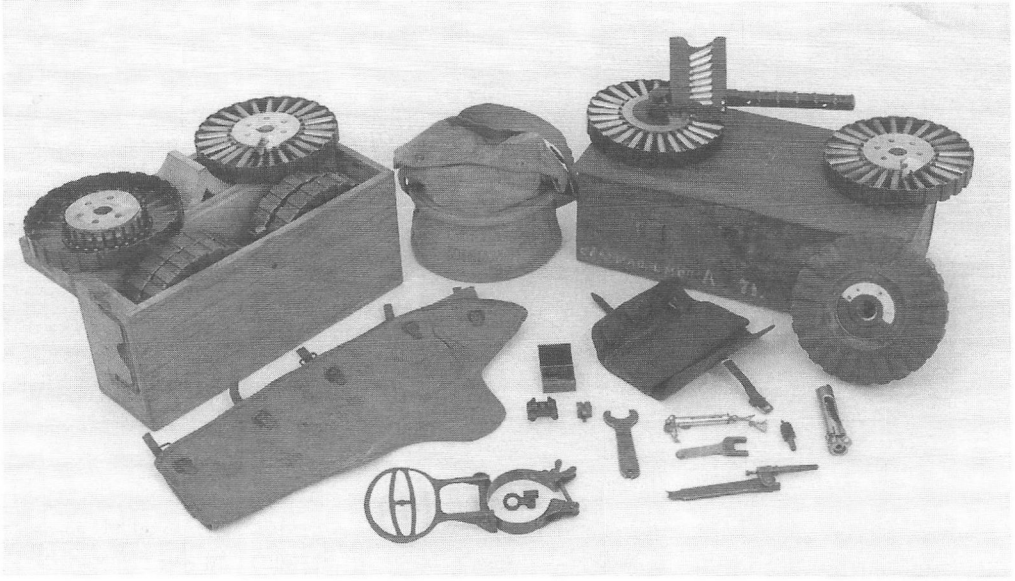
(right) Data plate showing serial number (2848) and manufacturing markings. (Robert G. Segel collection)

later manufactured in the United States by the Savage Arms Company of Utica, New York, under British contract. The Lewis gun was soon in the thick of fighting in France where is proved to be a reliable and popular weapon. There were no comparable weapons in the arsenals of the allies or the Germans early in the war. The Germans gave the Lewis gun the nickname of the "Belgian Rattlesnake."

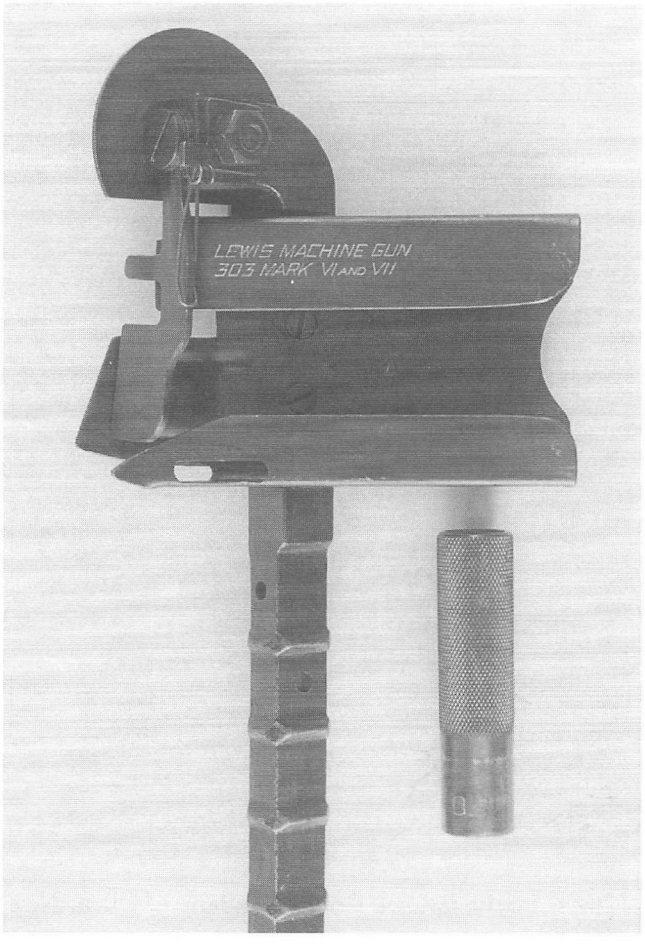
The Lewis gun was subjected to grueling tests by several countries, including another test by the U.S. An article in the March 8, 1917, issue of *Arms and the Man*



Patent dates stamped on buttplate of Lewis gun. (Robert G. Segel collection)



Grouping of Lewis gun accessories including ammo boxes with extra "pan" magazines, antiaircraft sight, loading machine, canvas receiver cover and various tools. (Robert G. Segel collection)



(above) Loading machine for Lewis gun magazines. This example designed for the British .303 Mark VI and VII cartridges.
(Robert G. Segel collection)

(below) British and American Lewis gun manuals.
(Robert G. Segel collection)

contained the following description of a typical test:

A field test of the Lewis gun last summer at Plattsburg proved that this weapon was capable of highly interesting performances. In the tests wet and dry sand was loaded into the magazines, which were then fired without cleaning, except the ejection of such sand as fell out when the magazines were shaken. Under these conditions the Lewis gun fired its required quota of shots in 1 minute and 3 seconds, and immediately after 188 additional shots in 53 seconds. The magazine was then filled with thick mud, the guns remaining uncleaned after the sand test, and the Lewis fired the required number of shots in 48 seconds. Twenty shots were then fired with deformed cartridges and battered shells in 3 seconds.

Such an impressive performance could not be matched by most light machine guns of the day.

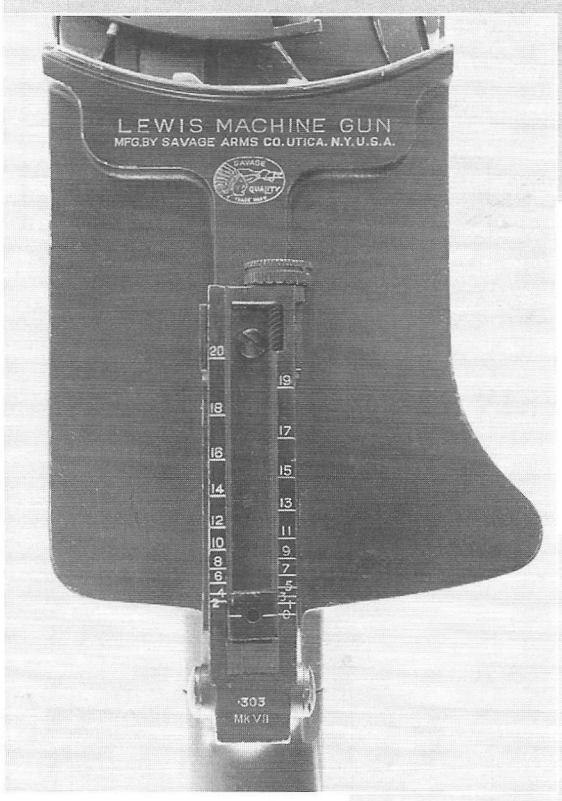
The British version of the Lewis gun was designated as the "Gun, Machine, Lewis 0.303 in, Mark I." The weapon weighed 28¼ pounds (with bipod), unloaded. It fed from a somewhat clumsy 47-round "pan" magazine mounted on top of the receiver. A loaded magazine weighed about 4½ pounds.

Although light for a contemporary automatic weapon, the Lewis gun required a bipod to help support the barrel which was encased in a metal jacket to aid in cooling the weapon. The weapon could be attached to a Vickers heavy machine gun tripod if so desired but it was seldom used in this manner. The Lewis gun fired fully automatic at a rate of 500 to 600 rounds per minute with a muzzle velocity of approximately 2,450 f.p.s.

On the eve of America's entrance into the war, the U.S. government took another look at the Lewis gun. In 1916, the U.S. Army purchased from the Savage Arms Company 350 Lewis guns in caliber .303 as made for the British. In spite of the non-standard caliber, some of these guns saw use in the hands of our troops in the Mexican Punitive Campaign of 1916. The AEF in France acquired some .303 caliber Lewis guns from the British and used them in combat.

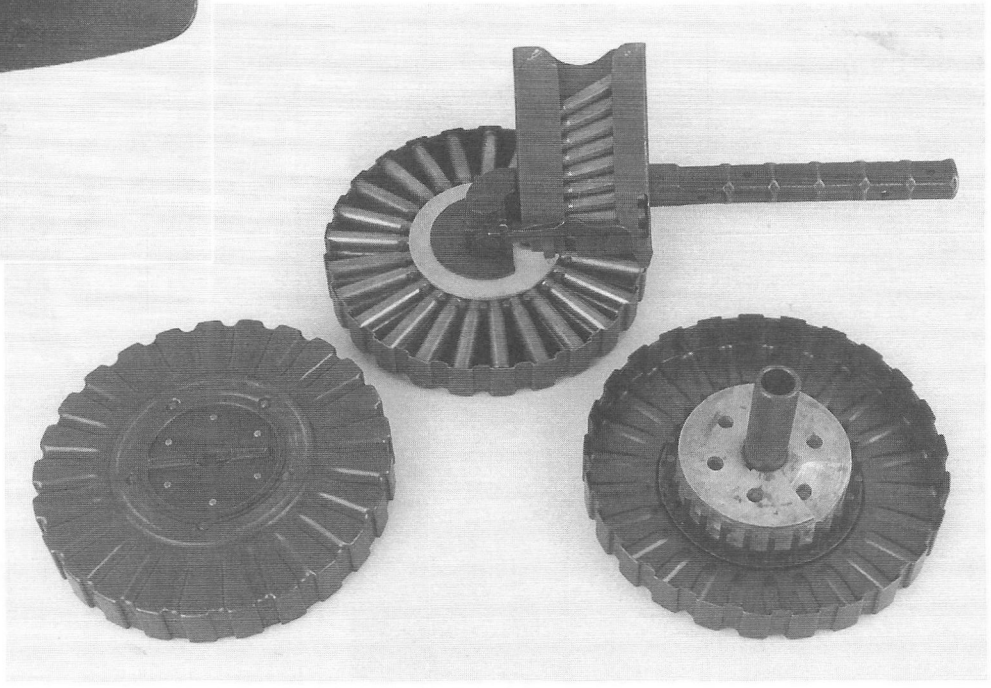
The Lewis gun's performance in the hands of the British and Belgians in the first years of WWI spoke for itself, but the ill feelings dating back to 1912 still lingered in the U.S. Army "establishment." The U.S. Navy, however, didn't have an ax to grind regarding the Lewis gun. The Navy ordered some 6,000 Lewis guns for the Marine Corps chambered for the standard U.S. .30-06 cartridge. The .30-06 version of the Lewis gun was designated as the "Model of 1917." Its physical characteristics were very similar to the British Mark I .303 Lewis gun. There were some inevitable development problems

Left-side view of Savage-made Lewis gun. Note the bipod and support, the "pan" magazine and raised rear sight. (Robert G. Segel collection)



encountered due to the incorporation of the more powerful .30-06 cartridge, and some changes in the manufacturing drawings were necessary. Despite these initial glitches, the .30-06 Lewis gun was quite popular with the U.S. Marines. The USMC established a "Lewis Machine Gun School" that was held at the Savage Arms Corporation facilities in Utica, New York. A number of Marine machine gunners attended this school and became quite adept at using the Lewis gun.

(above) View of Lewis gun rear sight and receiver markings. This example was made by the Savage Arms Company of Utica, NY. The rear sight is calibrated for the British .303 Mark VII cartridge.
(Robert G. Segel collection)



(right) Loading machine inserted into Lewis gun magazine. Note the two empty magazines below.
(Robert G. Segel collection)

The Marines adopted the "Cole cart," which could carry a Lewis gun and at least a thousand rounds of extra ammunition. The Cole handcart, named after a Marine Corps commander who was killed in France, was also used to transport other types of machine guns and weapons including the Stokes mortar and M1916 37mm gun. The Cole cart was the first utility handcart adopted by the United States armed forces.

Lewis Machine Gun with Field, or Infantry Mount in Position

Advertisement in WWI-vintage magazine.
(Robert G. Segel collection)

UNDER SEVENTEEN FLAGS

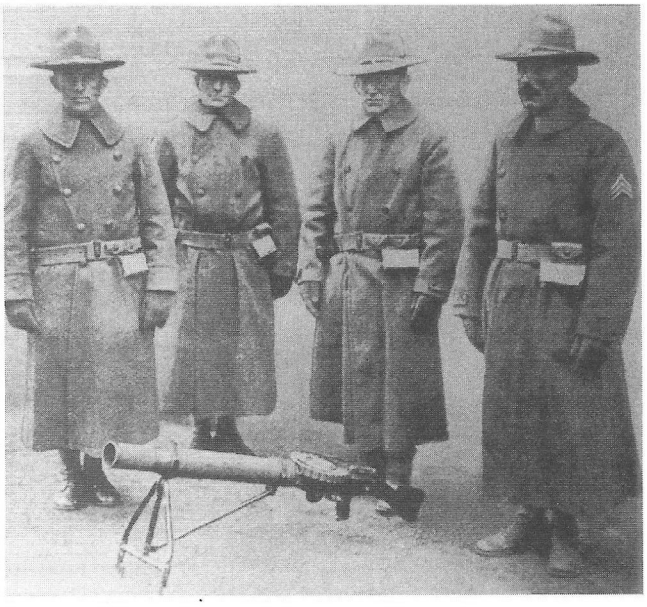
the Lewis Machine Gun is fighting. Approximately 100,000 are employed in the Armies and Air Service of the Entente Allies at the present time, with a steady stream of further production for new fighting units and replacements.

Essentially an American invention, produced first in America, the Lewis Machine Gun constitutes one of America's most important contributions to the Cause of Democracy.

(above) U.S. infantrymen of the 29th Division using .303 caliber Lewis gun in combat during World War I. **(Robert G. Segel collection)**

(right) Illustration from 1917 issue of *Arms and the Man* magazine depicting a USMC corporal with a M1917 Lewis gun.
(*American Rifleman* magazine)

(below) U.S. Doughboys with Lewis gun. **(Robert G. Segel collection)**



ARMS AND THE MAN

The Official Organ of the National Rifle Association of America.

VOLUME LXI. No. 21 WASHINGTON, D. C., MARCH 8, 1917. $3 a year. 10 cents a copy

The Machine Gun in the United States Army.

BY STEPHEN TRASK.

(Part II.)

The Light, Gas-Operated Arms.

CORPORAL BUNEW, U.S.M.C. DEMONSTRATING LEWIS MACHINE GUN FIELD EFFICIENCY IN ADVANCING IN OPEN ORDER, SHOWING THE MOBILITY OF THE GUN.

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To enumerate the multitude of machine gun types which have been invented since the Gatling and the *mitrailleuse* would be a task of extreme difficulty. They have appeared and after brief life disappeared, as, one after another, the majority proved impracticable. Yet through all have remained unassailed the two basic principles discovered by Bessemer and Maxim.

And so the machine guns of the present, like those two first practical guns of the past, are classified as either gas or as recoil guns, according to which of these agents is used in functioning the breech mechanism.

Since Bessemer demonstrated the feasibility of utilizing a part of the gas generated by the cartridge to eject the exploded shell and recharge the cartridge chamber, however, there have been collateral developments of other component parts, which has led to another classification based upon the system of preventing overheated barrels. Thus, in addition to the gas and recoil classification, there are air-cooled and water-cooled guns, which are regarded as distinct types.

A third distinction, which, to a certain extent depends upon the cooling system, is made between light and heavy guns, the air-cooled weapons usually falling into the light classification.

And so it is with weapons which may fall into any or all of these three classes that the United States Government is dealing at the present time, although ordnance experts declare that the water-cooled barrels resist erosion for a longer period than those which are air-cooled, and, consequently, enjoy longer life. This advantage, however, in considering the purposes to which the lighter guns are used, is nullified by the fact that the contents of the water jacket alone, exclusive of the jacket itself, adds about 10 pounds to the weight of the weapon. And so, sacrificing barrel-life to mobility, once barrels may be easily replaced, many governments, including the United States, have adopted, or are considering adopting, the air-cooled gun for its lighter types.

The lighter types of machine guns, either adopted or under test by the United States Government, are the Benet-Mercier, the Lewis and the so-called "Portable Hotchkiss," the latter having been subjected to no tests in this country as yet. All of these guns are air-cooled and all are gas-operated. The Lewis gun, however, differs radically from the others in the method of "feed," a drum containing 47 cartridges being used, while in the other rapid-firers tempered steel "clips" containing 30 rounds each are fed into the breech.

As to the comparative weights and relative mobility of the different guns, the Benet-Mercier, now in use in the Army, Navy and Marine Corps, weighs about 30 pounds, with the butt rest, and is constructed to fire from 250 to 400 rounds a minute. The Lewis gun weighs about 25 pounds, and fires from 550 to 750 shots a minute. The portable Hotchkiss, according to reports, weighs in the neighborhood of 16 pounds.

Definite recommendations upon the official adoption or rejection of both the Lewis and the portable Hotchkiss are expected to result from the deliberations of the Machine Gun Board recently appointed by the Secretary of War. This board, according to present plans, will conduct field tests beginning May 1 next.

Detailed data upon the new portable Hotchkiss, which is expected to prove a radical departure from the present portable of that make, are hard to obtain. Those possessing the most information concerning it declare that it will probably be a compromise between the 19½-pound machine rifle recently submitted to the United States and refused principally because of its weight, and the present form of light Hotchkiss; since the Hotchkiss company deemed it impracticable to reduce the machine rifle to the weight desired by the United States Government 19½ pounds) and determined instead to develop the machine rifle into an extraordinarily light machine gun. The number of cartridges which will be carried in each clip for this gun is also largely problematical. These new Hotchkiss portables have

The Army eventually purchased some 2,500 M1917 .30 caliber Lewis guns, but they were relegated to a stateside training role only. In addition to being used as infantry weapons, a large number of Lewis guns were used to arm aircraft during the WWI period.

When the Marines deployed to France, they were dismayed to have their Lewis guns taken away to be replaced by unfamiliar and somewhat suspect French automatic weapons. An AEF memo from the office of the chief of staff dated August 26, 1917, gave the official word on the subject:

U.S. Marines training with a M1917 Lewis gun. Note the M1903 Springfield rifle slung over the shoulder of the Marine in the foreground. (National Archives)

The Hotchkiss machine gun and the Chauchat automatic rifle with voiturettes (horse-drawn carts) have been adopted as the machine gun equipment of the troops now in France. It is considered that this equipment be kept uniform. It is therefore recommended that all of the Lewis guns now in the hands of or destined for the 5th Regiment of Marines be turned over to the Aviation Services; that the battalion recently arrived be provided with the Hotchkiss gun and the Chauchat rifle.

The Marines were understandably upset about having to exchange their familiar and reliable Lewis guns for the French weapons. A passage in *The History of the United States Marine Corps* stated:

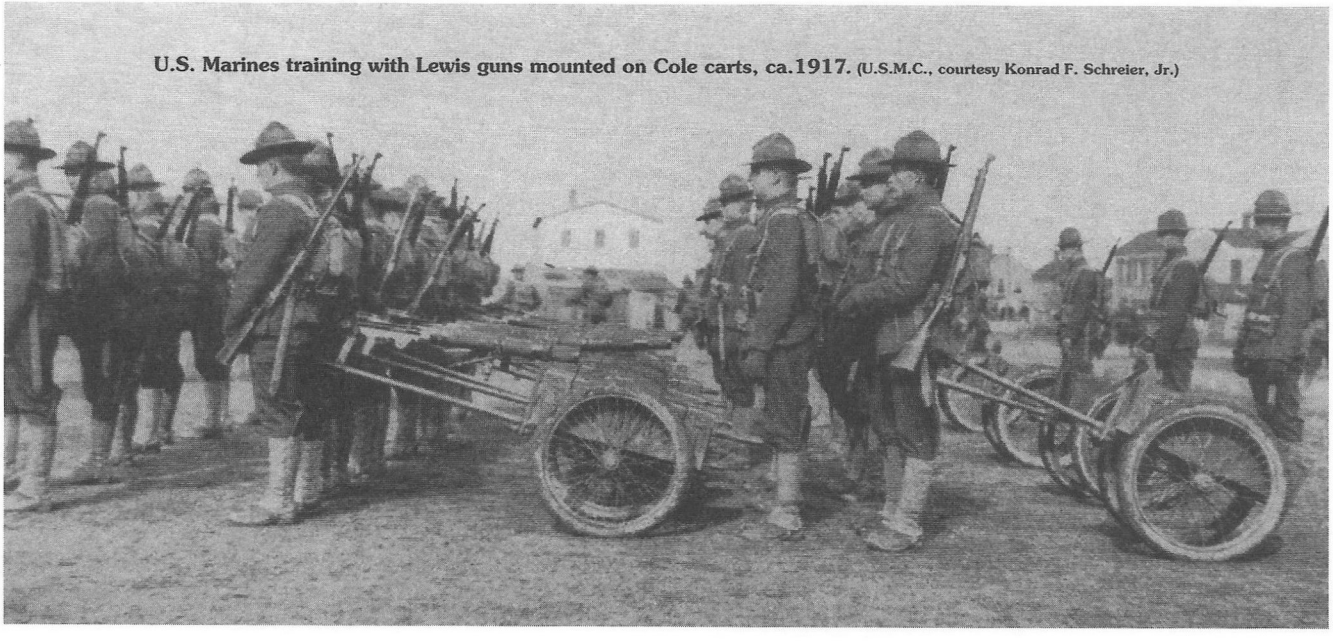
The Marines learned army drill, which they despised. They also turned in their trusted Lewis machine guns in exchange for French Chauchat automatic rifles and Hotchkiss machine guns, both heavy and unreliable weapons that used different ammunition from the Marines' Springfields, and thus complicated supply problems.

The Army Doughboys who had trained with the Lewis stateside were also unhappy about giving up the gun, but the Marines were more vocal about their dissatisfaction with losing the Lewis guns.

U.S. troops temporarily assigned to British units used the .303 Lewis guns in combat but few, if any, of the U.S. .30-06 M1917 Lewis guns were employed in ground combat roles during the war.

After the Armistice, the Navy and Marine Corps retained their Lewis guns, but the weapon was virtually abandoned by the Army. A few were made in the 1920s, but the supply of WWI-made Lewis guns was

U.S. Marines training with Lewis guns mounted on Cole carts, ca.1917. (U.S.M.C., courtesy Konrad F. Schreier, Jr.)



sufficient to meet most of the needs of the postwar Navy and Marine Corps. An objective assessment of the Lewis gun indicated that it was neither "fish nor fowl." It was too heavy for use as an automatic rifle and was not capable of long-range, sustained fire in the role of a standard machine gun.

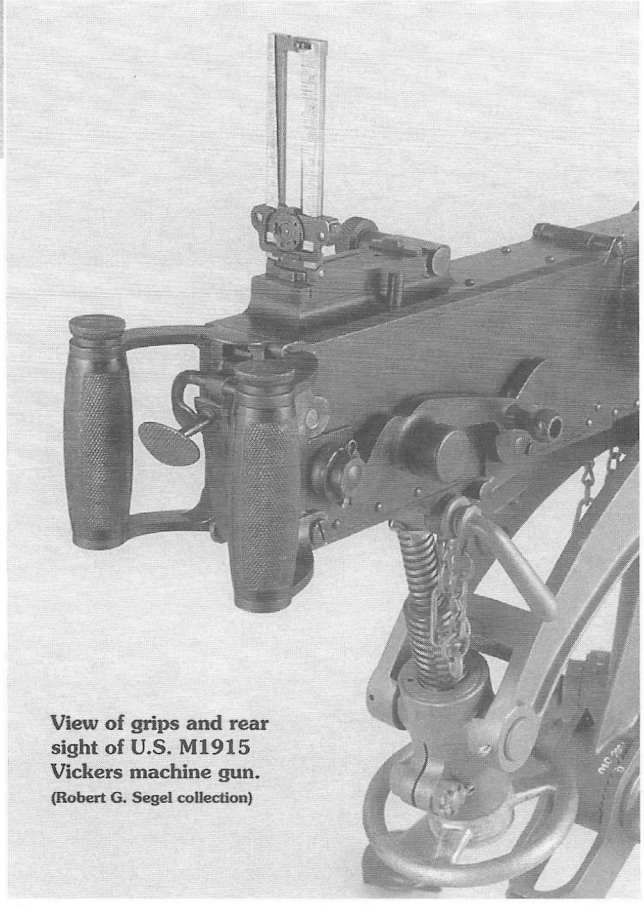
Despite little use in combat by American infantry units, the Lewis gun was widely used by our British and Belgian allies. Many Marines, and more than a few Army troops, were quite unhappy about having to give up the Lewis for Chauchat and Hotchkiss guns. It is unfortunate that the Lewis gun did not have more of an opportunity to be used in combat by American units. The weapon was, nevertheless, an important part of the Allied arsenal of the First World War and a good example of a weapon that deserved more support from the U.S. Army. Had the weapon been given more of a chance to see action in the hands of the Doughboys, the "Belgian Rattlesnake" would have bitten a good many more Germans.

Vickers Machine Gun

Unquestionably, one of the best machine guns of the war was the Vickers. The Vickers was based on the Maxim machine gun but incorporated a number of improvements. As mentioned previously, the Maxim was a heavy and complex weapon. The engineers at Vickers were able to design a water-cooled machine gun based on the Maxim mechanism that was almost half the weight of the original pattern and was also somewhat cheaper to manufacture. The British government adopted a .303 caliber Vickers machine gun as the "Mark I," and the weapon was their standard machine gun during WWI. The British were, with good reason, very fond of the Vickers, although the weapon was in short supply during the first two years of the war. It is interesting to note that the British often used petrol tins (gasoline cans) as water containers for their Vickers machine guns. Vickers machine guns (stripped of their water-cooled apparatus) were also popular for use on aircraft.

Right-side view of U.S. M1915 Vickers machine gun mounted on Mark IV tripod. Gun is fitted with water box and hose.
(Robert G. Segel collection)

Left side of U.S. M1915 Vickers .30 caliber machine gun and Mark IV tripod.
(Robert G. Segel collection)



View of grips and rear sight of U.S. M1915 Vickers machine gun.
(Robert G. Segel collection)

As we have discussed on several occasions, the U.S. armed forces were very short of modern machine guns prior to America's declaration of war. The Ordnance Department was aware of the excellence of the Vickers' design, and in late 1915, the weapon was adopted by the United States as the "Model of 1915." The M1915 U.S. caliber .30 Vickers machine gun weighed 33 pounds with an empty water jacket and 42 pounds with a full jacket (compared to almost 75 pounds for a full Maxim machine gun). The U.S. Vickers tripod weighed about 56 pounds. The weapon fired at the rate of over 500 rounds per minute from a web belt holding 250 rounds.

Even though the Vickers was an excellent weapon, an initial order for only 125 guns was given to the Colt's Patent Firearms Manufacturing Company of Hartford, Connecticut. Colt completed the first batch of Vickers guns for the U.S. government in May of 1917 and also manufactured about 1,000 Vickers machine guns for the Russian government. These

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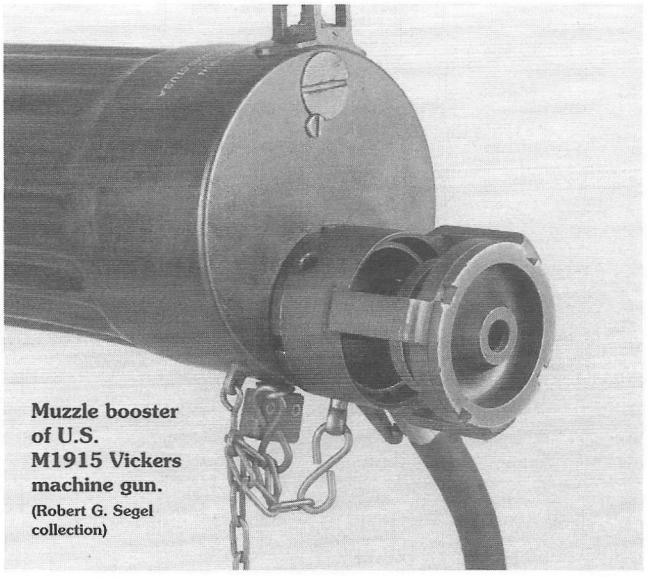
Test firing early Colt M1915 Vickers machine gun.
(Donald Blake Webster)

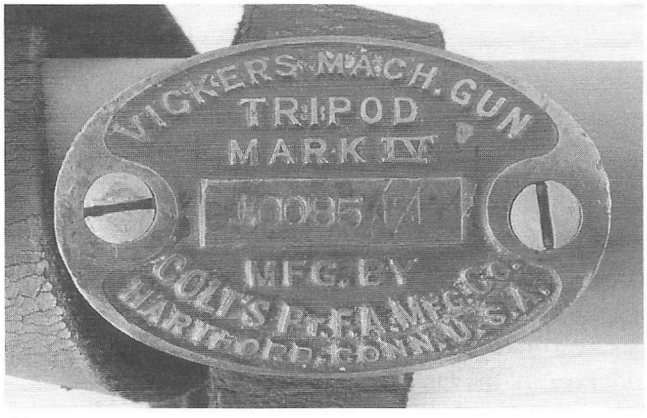


Muzzle booster of U.S. M1915 Vickers machine gun.
(Robert G. Segel collection)

(above) Doughboys firing M1915 Colt Vickers machine gun, Argonne, 1918. (Rogert G. Segel collection)

(below) U.S. soldiers of the 356th Infantry, 89th Division, practicing firing Vickers machine guns. Photo dated Septembdr 4, 1918.
(U.S. Army Military History Institute)

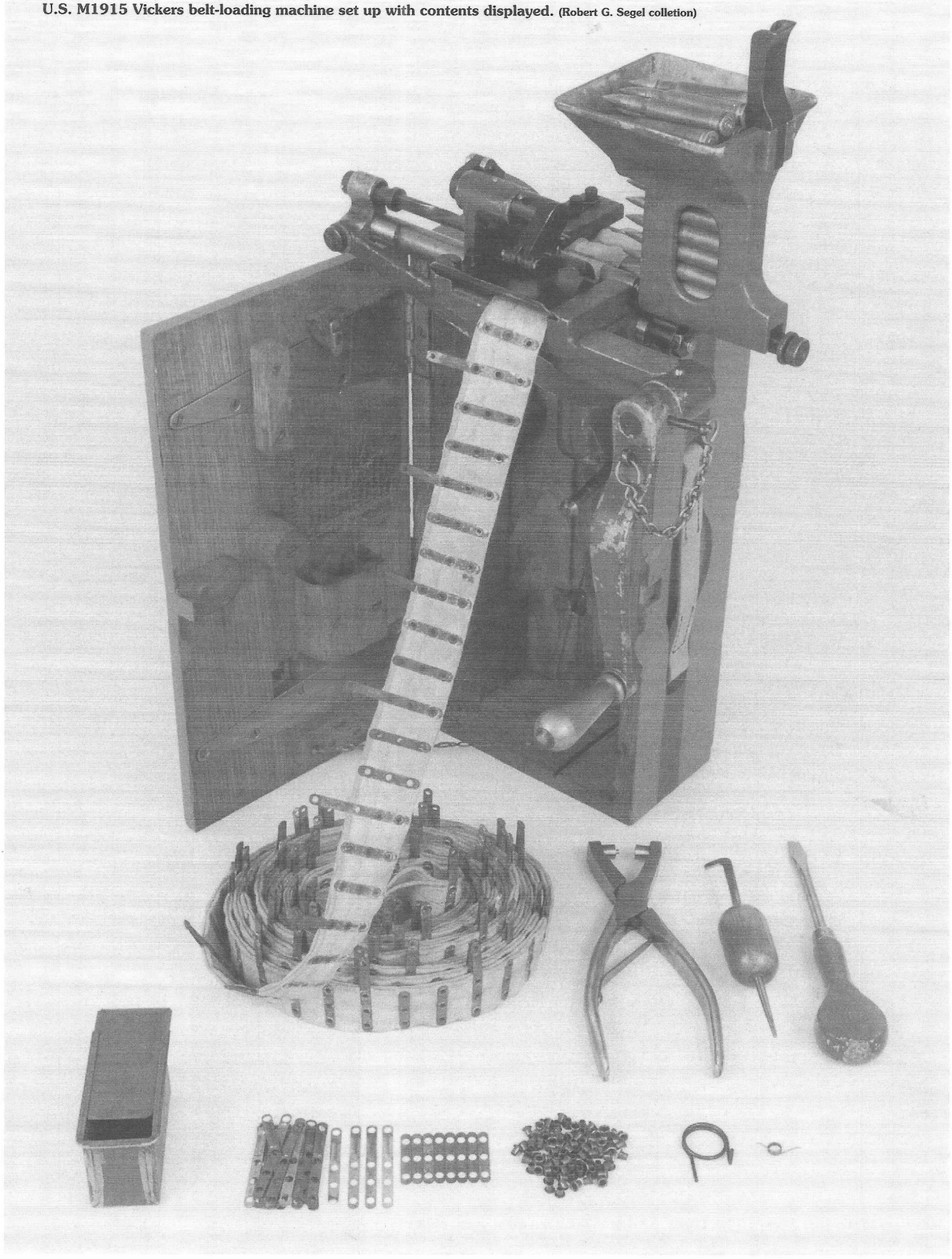
Markings on U.S. M1915 Vickers machine gun manufactured by Colt. The serial number of this example is 5983.
(Robert G. Segel collection)

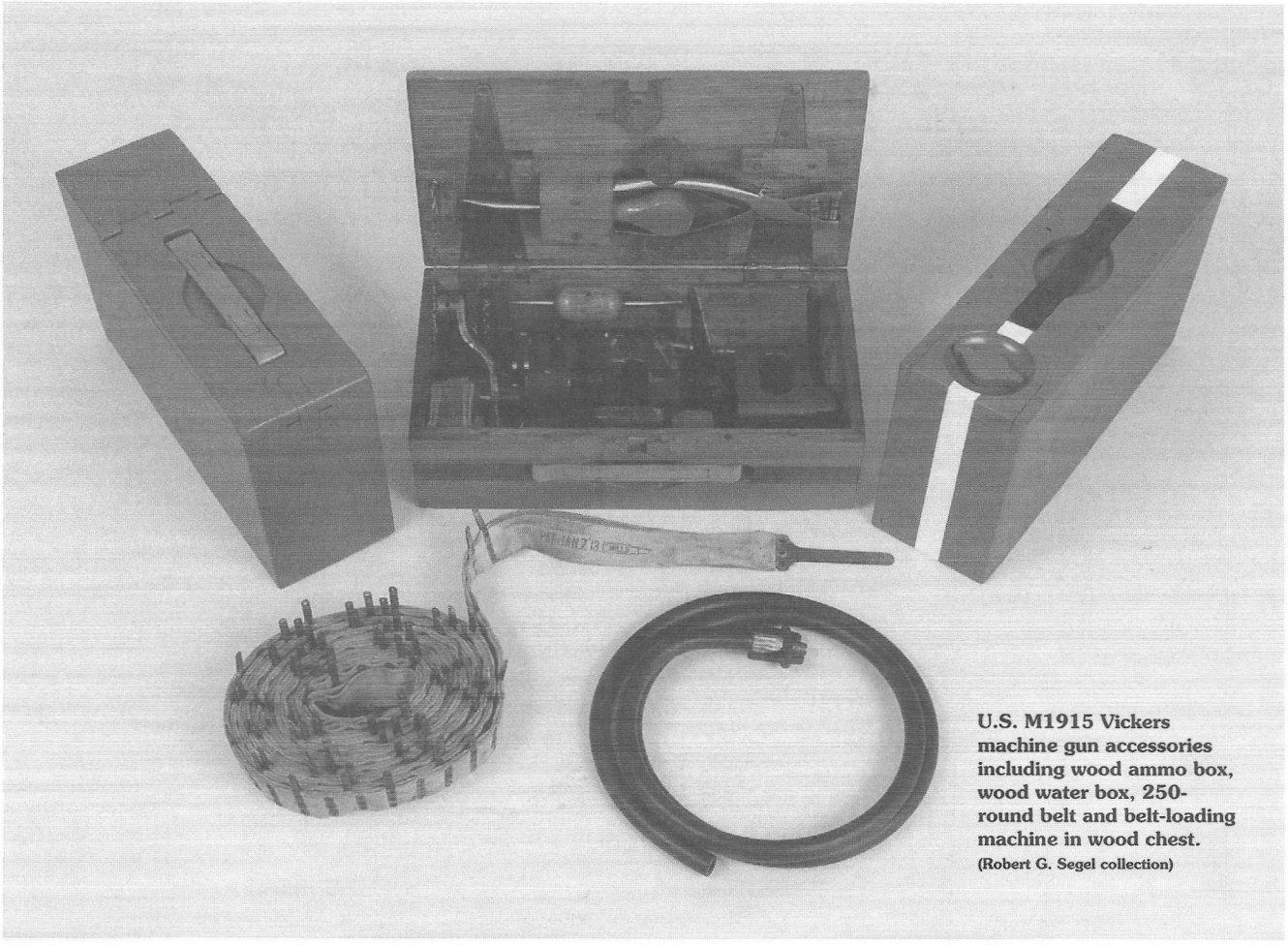


(above) Markings on Mark IV tripod for Colt M1915 Vickers machine gun. Although both the U.S. and British tripods had the same "Mark IV" designation, the Colt-made gun will not fit on the British-made tripod. (Robert G. Segel collection)

(below) Data plate for U.S. M1915 Vickers machine gun belt-loading machine made by Colt. (Robert G. Segel collection)

U.S. M1915 Vickers belt-loading machine set up with contents displayed. (Robert G. Segel colletion)

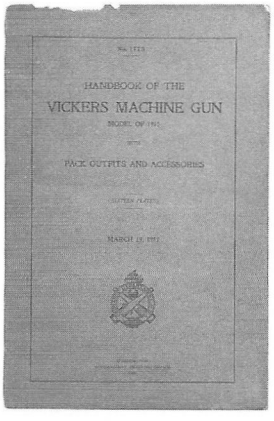


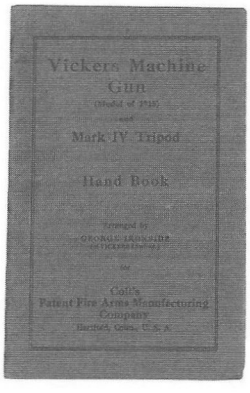


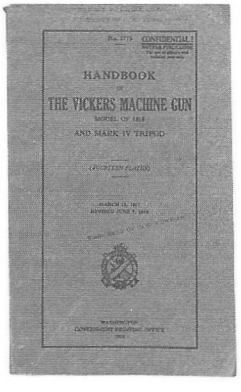
U.S. M1915 Vickers machine gun accessories including wood ammo box, wood water box, 250-round belt and belt-loading machine in wood chest. (Robert G. Segel collection)

Members of the U.S. Army's 77th Division firing Vickers machine guns, Monne Cove, France, May 18, 1918. (U.S. Army Military History Institute)

Selection of U.S. government manuals for Vickers machine gun. (Robert G. Segel collection)







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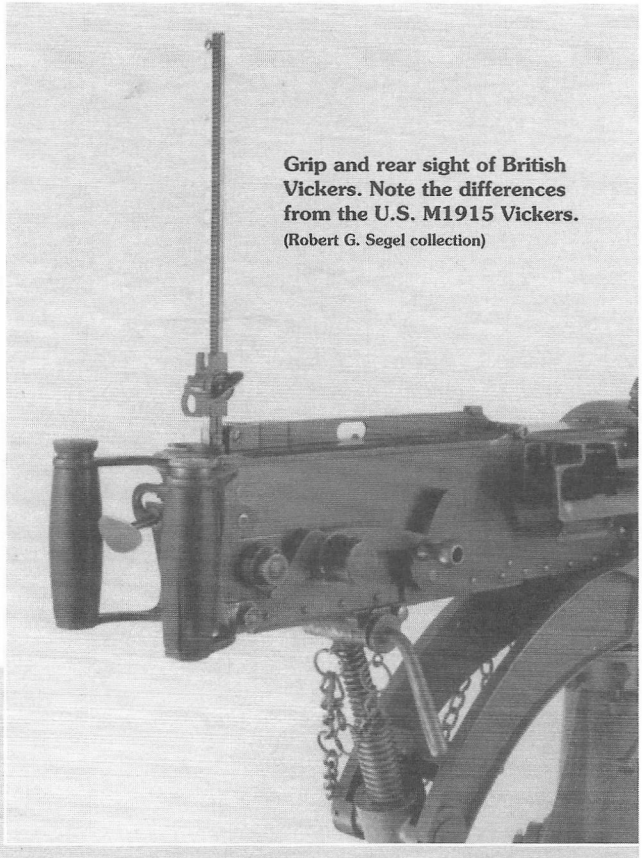
weapons were chambered for the 7.62mm Russian cartridge. American's entry into the war resulted in additional orders for M1915 Vickers machine guns from Colt with a total of 12,125 being procured by the time production ceased in October of 1918. However, almost 3,000 of these infantry-type Vickers machine guns were converted to aircraft use, although only about 1,000 were actually delivered overseas before the end of the war. Colt also modified some of the Russian Vickers to take the big 11mm cartridge for aircraft use.

As was the case with the Vickers guns made in England, deliveries of the Colt-made Vickers lagged behind the preliminary production estimates. This problem was addressed by the Assistant Secretary of War in his 1919 report *America's Munitions*:

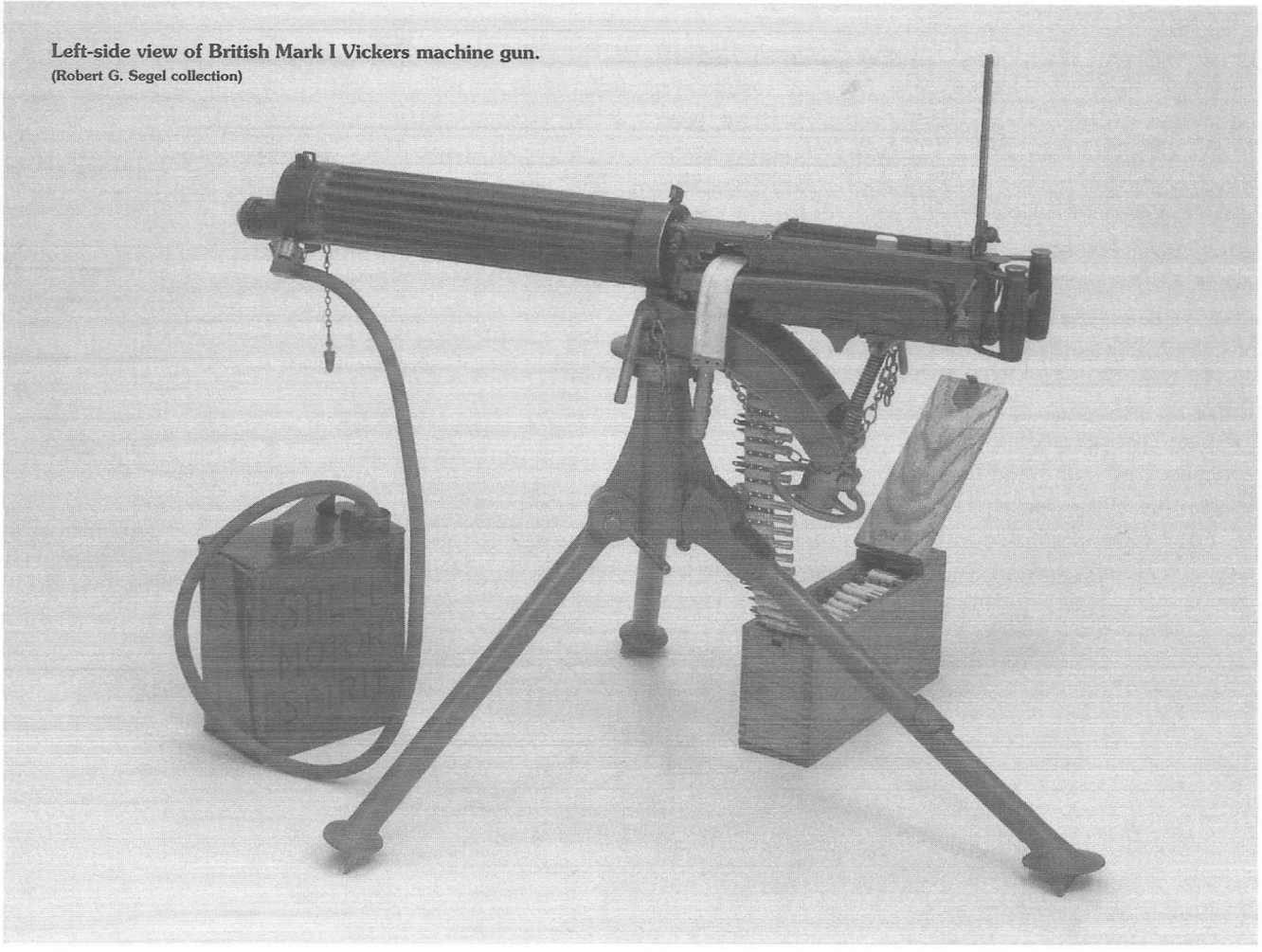
For technical reasons that need not be explained here, the Vickers gun was a difficult one

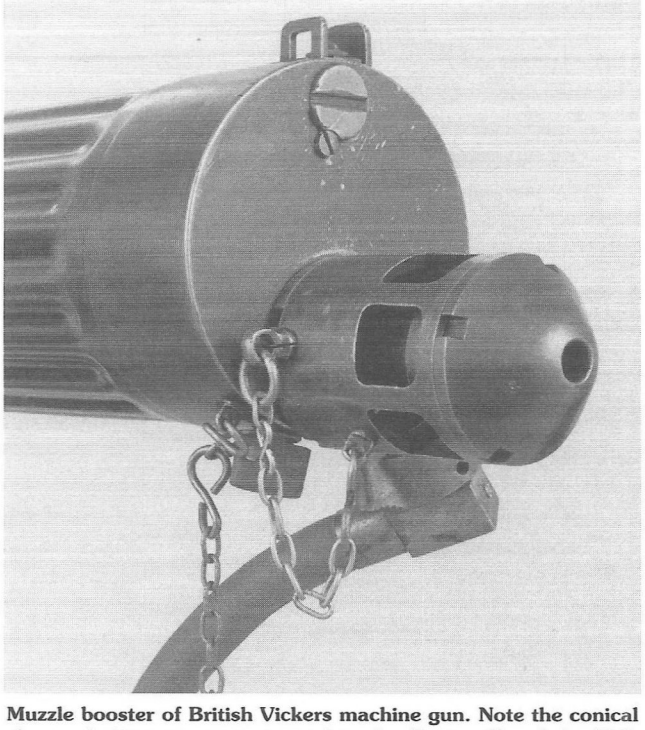


Grip and rear sight of British Vickers. Note the differences from the U.S. M1915 Vickers.
(Robert G. Segel collection)

Right-side view of British Mark I Vickers machine gun, .303 caliber with Mark IV tripod. Note wood ammo box and motor oil tin used as water can.
(Robert G. Segel collection)

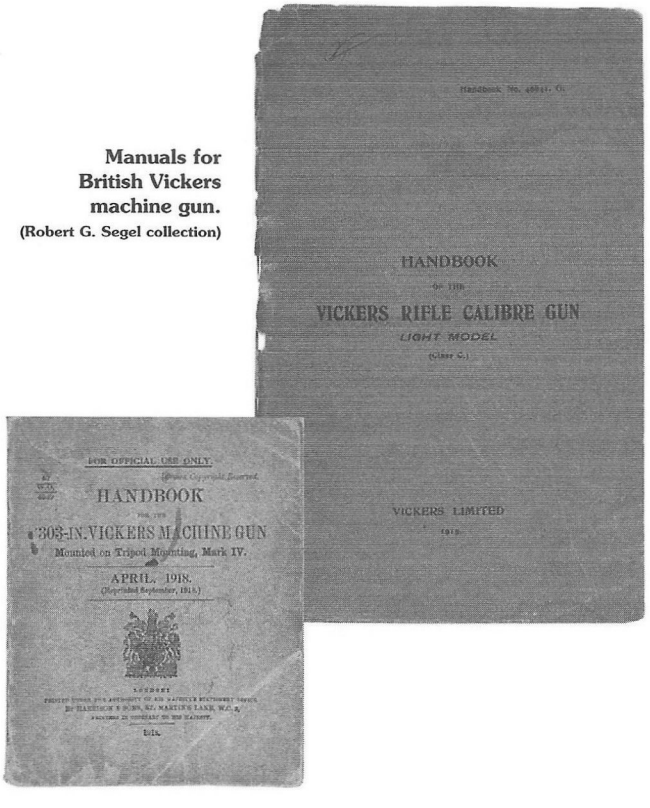
Left-side view of British Mark I Vickers machine gun.
(Robert G. Segel collection)





Muzzle booster of British Vickers machine gun. Note the conical shape of this type as compared to the flat profile of the U.S. model. **(Robert G. Segel collection)**

Manuals for British Vickers machine gun.
(Robert G. Segel collection)



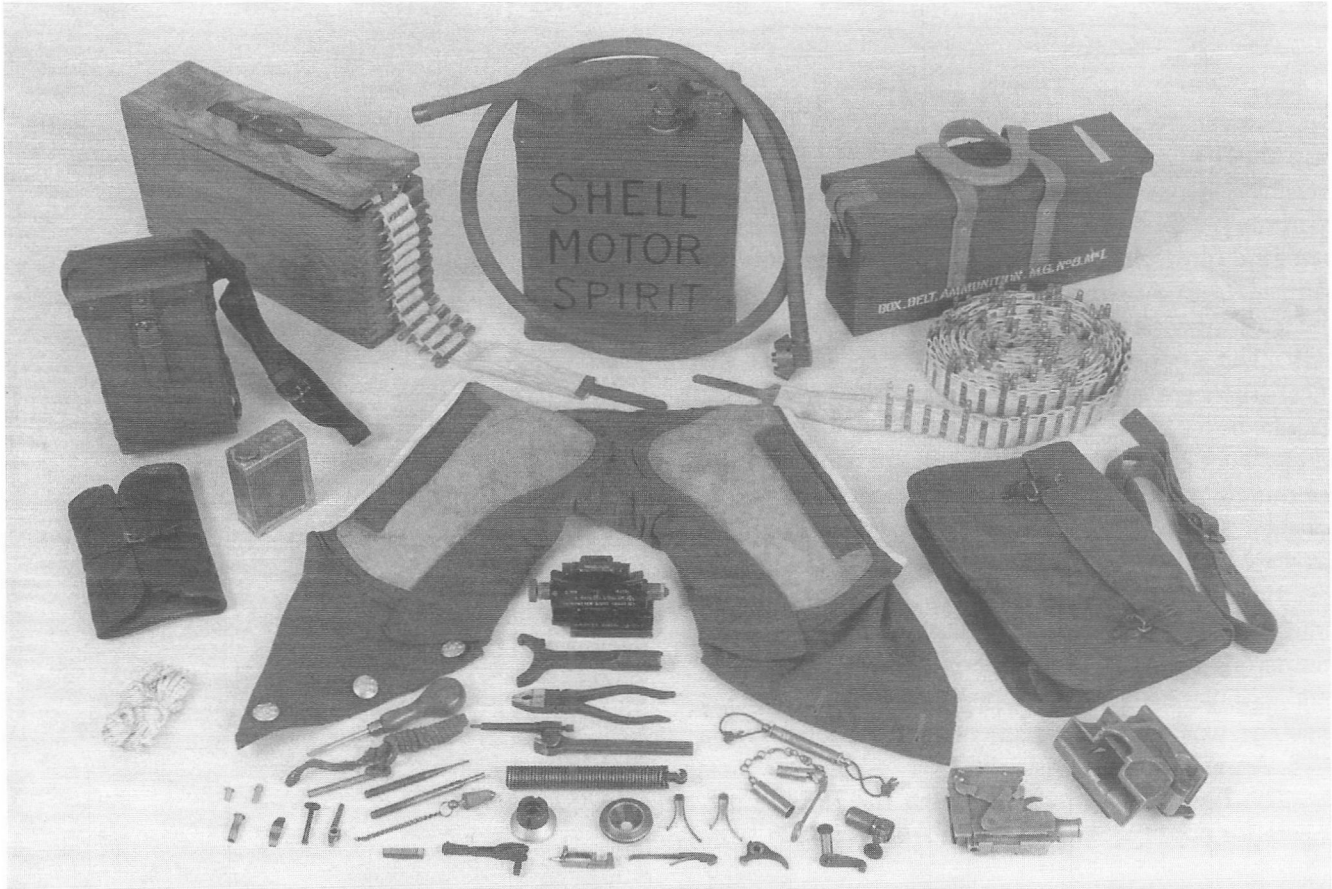
to manufacture. The Colt Co., which was producing these weapons, in spite of their long experience in the manufacture of such arms and in spite of their utmost efforts, had been unable to deliver the finished Vickers guns on time, either to the Russian government or to this country. However, by expanding the facilities of this factory to the utmost, by the month of May, 1918, the concern achieved a production of over 50 Vickers guns per day.

There was a bit more acrimony between the Colt Company and the Ordnance Department regarding Vickers production than was revealed in the postwar report by Assistant Secretary of War Crowell. During the war, an Ordnance Department memorandum stated, in effect, that Colt was doing a poor job producing the Vickers machine gun. As quoted in the memo:

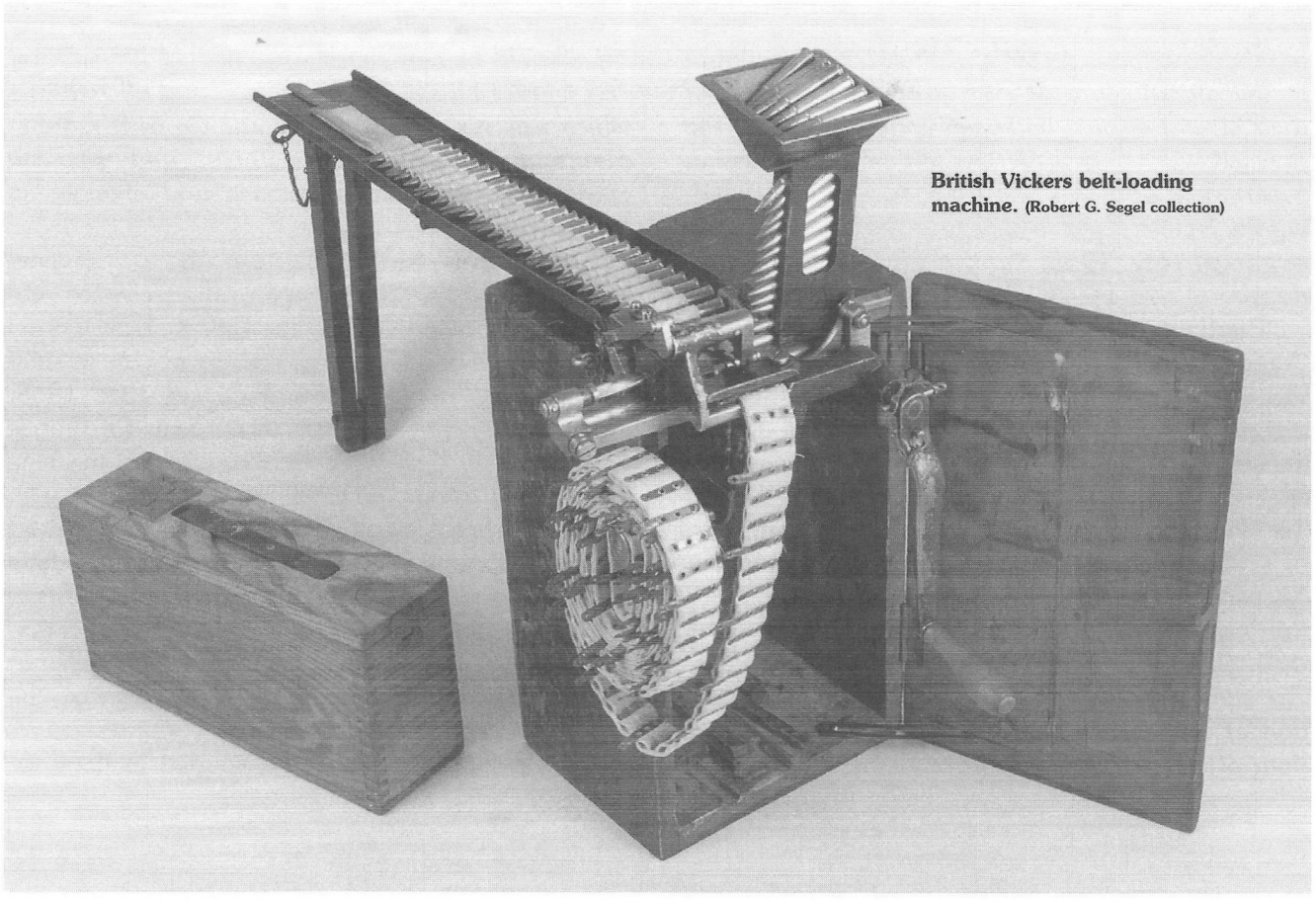
...the Company's (Colt's) delay in turning out (Vickers) guns at stated deliveries, in the opinion of the Inspecting Officer, was due to their not using their plant and equipment to the best advantage. The work showed lack of care and laxity in production of the parts which seriously delayed production. Steps were taken to correct these difficulties but it was not believed that the contracts at that time would be completed on schedule time. Delay was caused by the Inspector rejecting all material which was not strictly in accordance with requirements and the interchangeable, and also on account of material extensions and changes in their plant.

Despite this friction between the government inspectors and the Colt Company, the increased production by the firm enabled the U.S. to issue Vickers machine guns to a fairly large number of U.S. infantry units. During the period of May and June 1918, eleven American divisions were sent to France equipped with Colt-made M1915 Vickers machine guns. These troops, however, were still saddled with French Chauchat automatic rifles when they arrived overseas. Some 7,653 M1915 Colt Vickers machine guns were sent to France by the time of the Armistice. The balance remained in U.S. training camps. All outstanding contracts for the Vickers were cancelled in September of 1918 as the M1917 Browning machine gun began to be issued.

The Vickers were often transported in horse or



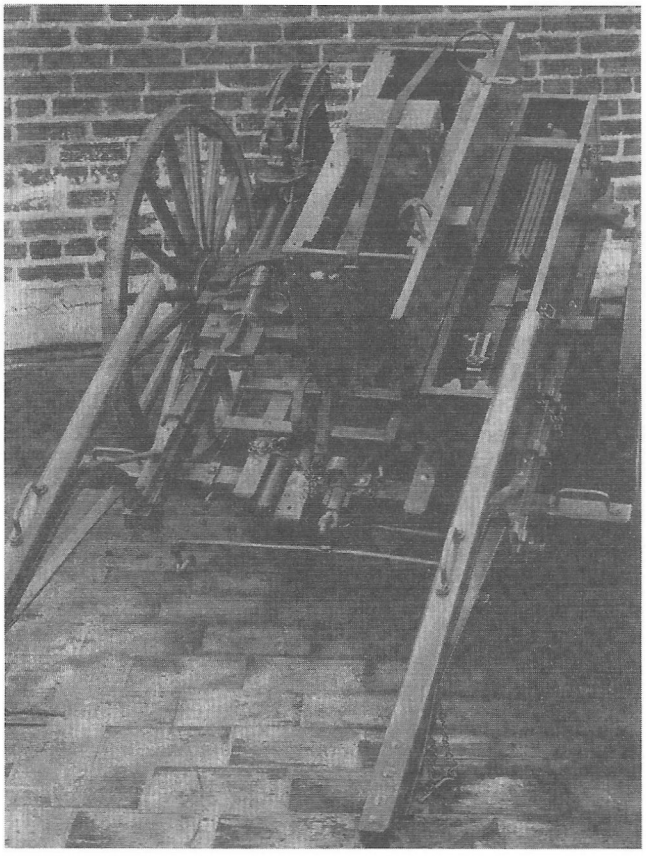
Accessories for British Mark I .303 caliber Vickers Mark I machine gun.



British Vickers belt-loading machine. (Robert G. Segel collection)

mule-drawn "voiturette" machine gun carts (as were the M1914 Colt, M1917 Lewis and M1917 Browning machine guns) along with extra ammunition, spare parts and tripod. There were a few problems noted with the completed Vickers guns including several that arrived from America with rusted locks. The recoil plate of the Colt-made guns was also found to be too soft. The Ordnance Department conferred with the Colt engineers, and it was determined that production would be severely curtailed if the metallurgy procedures were changed. The problems encountered were of a fairly minor nature and did not reduce the utility of the weapon. Compared to the other machine guns available at the time, the Vickers was the favored type by the vast majority of Doughboys, at least until the introduction of the M1917 Browning. There were numerous contemporary reports regarding the Vickers' popularity with the Doughboys. The following passage was part of a postwar report issued by the U.S. Army's Fourth Division:

The Fourth Engineers drew on the Royal Engineers for supplies, studied their methods at a large



M1917 machine gun cart. Note the M1915 Vickers machine gun in the chest at right and the folded Mark IV tripod at left. (U.S. Army)

dump and built rifle ranges. Vickers were guns served out to the machine gunners, much to their delight...

Except for cartridges utilized, there were few differences between the British-made Mark I Vickers and the U.S. Colt-made guns. In fact, some parts of the British and American Vickers could be interchanged with a bit of hand-fitting. The main external differences between the U.S. and British Vickers machine guns were:

- The British guns had wood grips while the American guns had plastic grips.
- The rear sight and base on the U.S. guns were shorter than those found on the British guns.
- The American Vickers' rear sight was graduated to 2,500 yards.
- The U.S. guns were marked with the serial number, model number manufacturer and patent dates while the British guns were only marked with the serial number.
- The U.S. Vickers gun had a flat muzzle booster and the British gun had a cone-shaped booster.

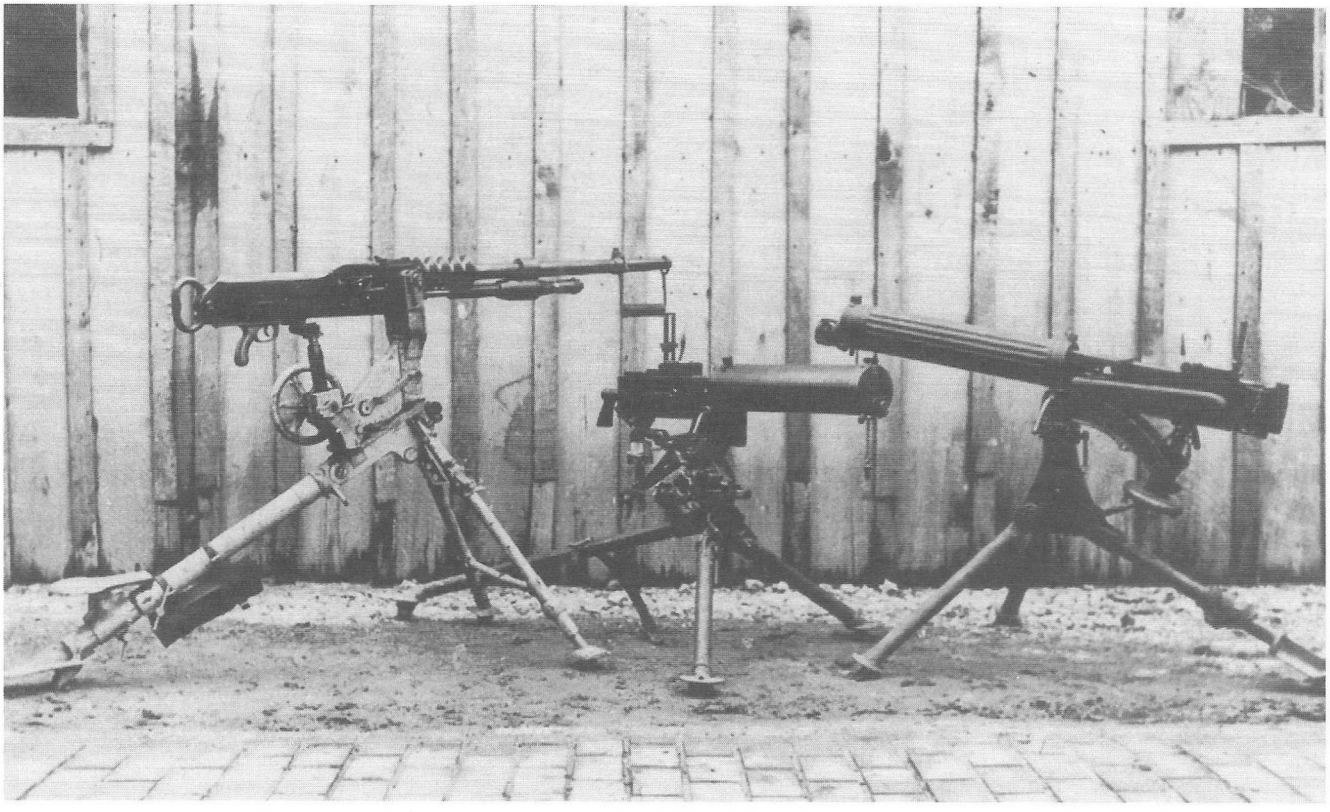
Both the U.S. and British Vickers tripods were designated as the "Mark IV" although it should be noted that the Colt-made gun will not fit on the British tripod.

While the U.S. .30-06 cartridge was superior to the British .303, at typical infantry machine gun ranges, the difference was not normally very important. From all indications, the Doughboys held the British Vickers in as much esteem as their Colt-made counterparts.

There was a great deal of experimentation in ways to better employ the Vickers (and other) heavy machine guns. One interesting concept was contained in a report of a machine gun company of the 353rd Infantry:

A novel method of transporting and firing the gun was devised by Sgt. C.G. Latchem, 353rd Infantry, and successfully used in this attack (Bois de Mort Mare). The gun was strapped to the back of the No. 1 man, muzzle up. When a target was presented, the man laid down, placed his helmet over the back of his head and neck to avoid injury from the flash and the gun was fired from his back. During the advance the gun was covered by a shelter half, making it almost impossible to identify the machine gun as such. Thus the guns kept up with the infantry and got into action in the minimum of time.

This experiment was certainly a novel approach to increasing the mobility of the heavy machine gun, but volunteers to be the "No. 1 man" might have been hard to come by! Even though the Vickers was much



(left to right) M1914 Hotchkiss machine gun, M1917 Browning machine gun, M1915 Vickers machine gun. (U.S. Army, courtesy Konrad F. Schreier)

lighter than the Maxim machine gun, carrying one in this manner would have been, to say the least, taxing.

The adoption of the M1917 Browning machine gun (to be discussed shortly) resulted in outstanding orders for the Colt-made Vickers being cancelled. The Vickers machine guns were scheduled to be replaced totally by M1917 Brownings, but the war ended before this could be accomplished. The M1915 Vickers remained "Limited Standard" for the U.S. Army after WWI. However, the Vickers machine gun was seldom, if ever, used by the Americans after the end of the First World War, although it was not declared "Obsolete" until 1944.

French M1914 Hotchkiss Machine Gun

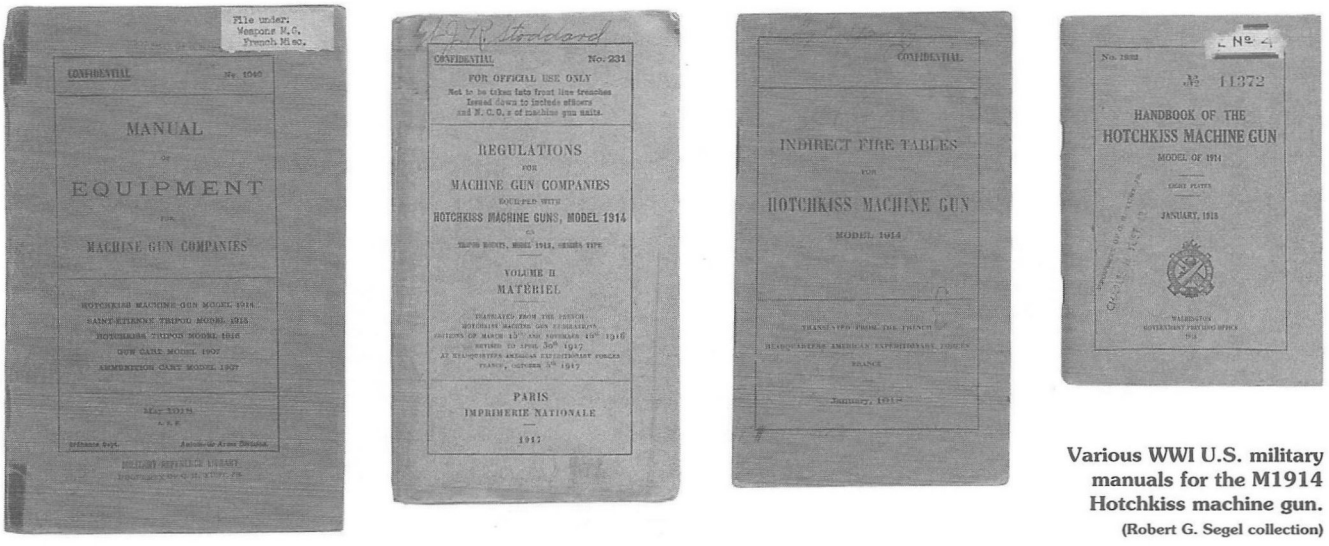
The standard French heavy machine gun during World War I was the 8mm "Mitrailleuse Hotchkiss Modele 1914." The French M1914 Hotchkiss had several design features that differed from the heavy machine guns of other nations. The gas-operated weapon was developed by an Austrian cavalry officer, Baron von Odkalek. The original design was rather crude but it offered much promise. In 1893, the Paris-based firm of Hotchkiss began acquired rights to the design and began work on refining the weapon. The founder of the Hotchkiss firm, Benjamin Hotchkiss, was an American as was his chief engineer, Laurence Benét. Benét worked refining the weapon for two years, and the most vexing problem was how to cool the barrel of the weapon due to the tremendous heat generated by an automatic weapon firing rifle-caliber ammunition. The traditional approach was to encase the barrel in a water jacket to provide the necessary cooling as was done with the Maxim design. Instead, Benét chose to encase the barrel in a series of bronze rings (later changed to steel) to provide "radial" air-cooling. These "cooling rings" reportedly increased the cooling effects by a factor of ten as compared to standard smooth machine gun barrels. It is reported that the French government wished to eliminate the necessity for providing water for machine gun barrel jackets due to the scarcity of the commodity in arid regions such as French North Africa, thus the emphasis on an air-cooled mechanism. In addition to being air-cooled, the Hotchkiss machine gun utilized metal feed strips rather than the more common web cartridge belts. This was primarily due to patent considerations. The U.S. Ordnance Department tested an

Right-side view of French Hotchkiss M1914 8mm machine gun with tripod. Note the wooden ammo box with a strip of cartridges in the foreground. (Robert G. Segel collection)

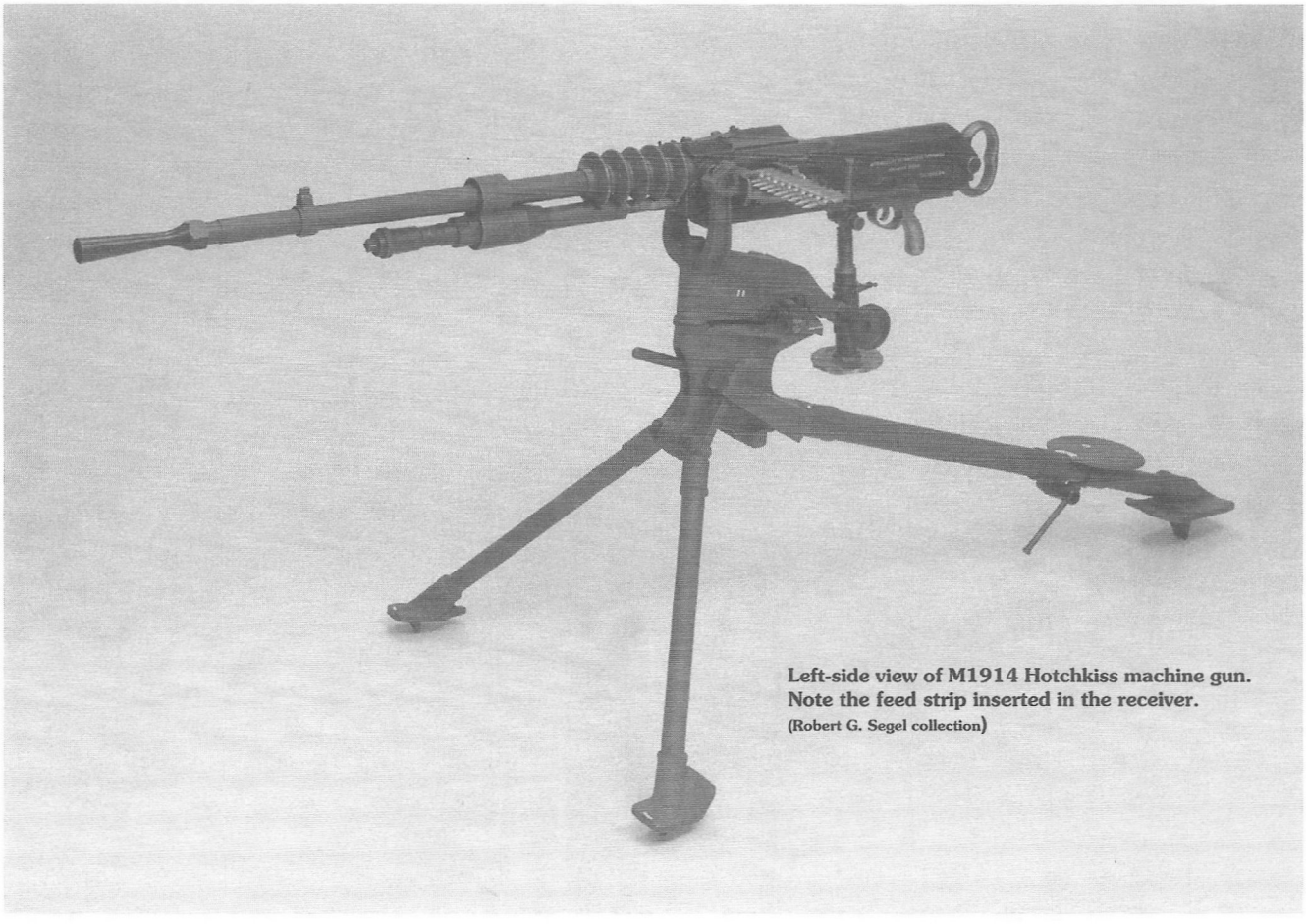
early version of the Hotchkiss machine gun in 1896 and 1897 chambered for the .30-40 Krag cartridge but the gun was rejected for a variety of reasons. The French government purchased limited numbers of the early Hotchkiss guns.

By 1900, an improved version of the Hotchkiss machine gun was ready for quantity production. Among the first nations to purchase the weapon was Japan. The improved Model 1914 version was adopted by France just prior to the outbreak of the First World War to counter the German build up.

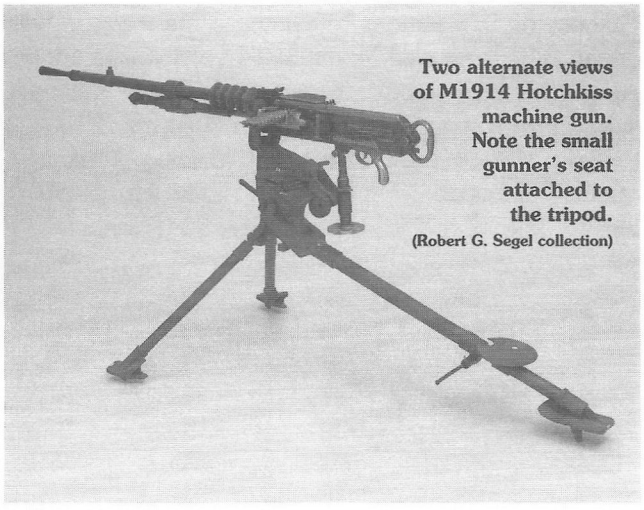
The M1914 Hotchkiss weighed 54 pounds, 11 ounces (unloaded) and was 51½" long with a 30½" barrel. The tripod added another 54 pounds. The



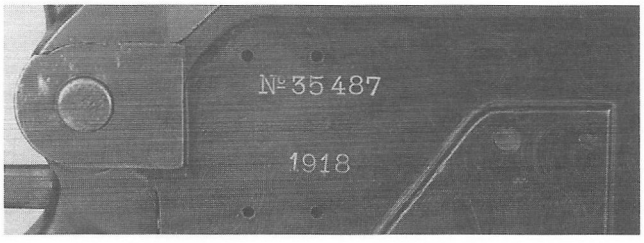
Various WWI U.S. military manuals for the M1914 Hotchkiss machine gun.
(Robert G. Segel collection)



Left-side view of M1914 Hotchkiss machine gun. Note the feed strip inserted in the receiver.
(Robert G. Segel collection)

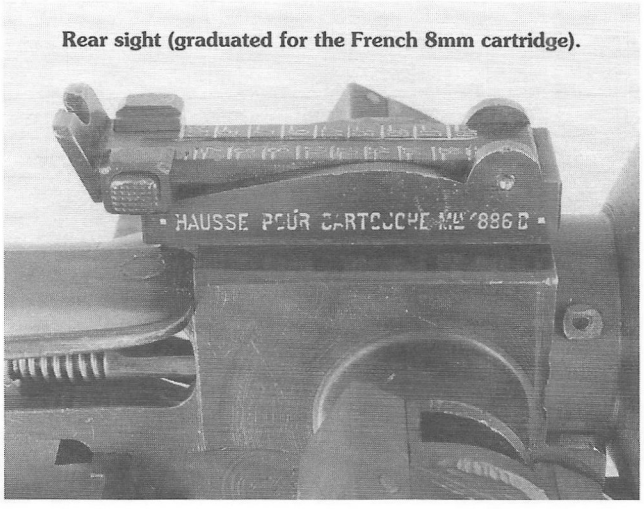


Two alternate views of M1914 Hotchkiss machine gun. Note the small gunner's seat attached to the tripod.
(Robert G. Segel collection)



(above, left) Close-up view of receiver markings.
(above, right) Left-side view of receiver markings showing serial number 35487 and date of production as 1918. (Robert G. Segel collection)

Close-up view of receiver and breech area. Note the elevation adjustment under the pistol grip.
(Robert G. Segel collection)



Rear sight (graduated for the French 8mm cartridge).

American soldiers firing a French M1914 Hotchkiss machine gun. (National Archives)

weapon fired at a cyclical rate about 400 rounds per minute. Both 24- and 30-round metallic feed strips were used. The gun was also adapted for use with a 250-round "semi-articulated" metal belt. The Hotchkiss was chambered for the standard French 8mm cartridge which gave a muzzle velocity of 2,375 feet per second.

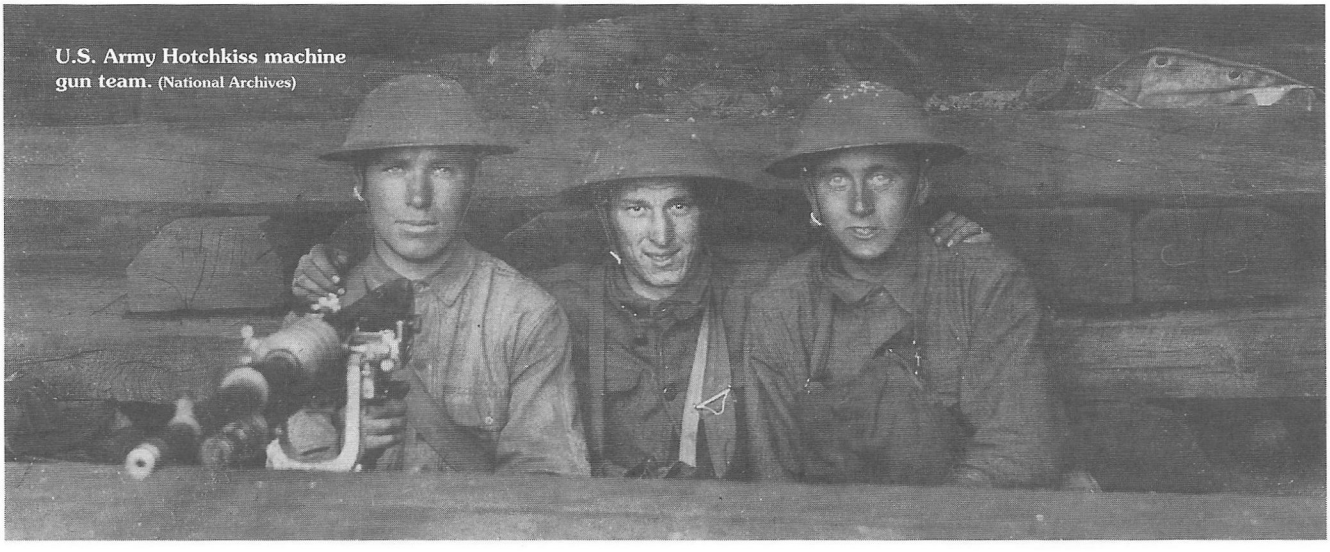
The fact that the necessity to obtain water to fill barrel jackets and the attendant equipment was eliminated certainly gave the Hotchkiss some advantages. However, even though it did not require a water-filled barrel jacket, the Hotchkiss was actually heavier than the Vickers due to the massive barrel and cooling rings. In any event, the French poilu became accustomed to the Hotchkiss and appreciated the weapon's durability and firepower. Large numbers were manufactured and issued to the French during the war.

When the United States deployed troops overseas, many Doughboy units, by necessity, were equipped with the 8mm M1914 Hotchkiss machine gun when they arrived in France. After some preliminary training, American troops had ample opportunity to use their French-made Hotchkiss machine guns against the Germans. The most common complaint against the Hotchkiss was its weight. A Doughboy from the 101st machine gun battalion related the following in the book *Make the Kaiser Dance*:

The gun (Hotchkiss) and tripod weighed a total of 110 pounds; then we had all that ammunition. It was one hell of a load!

In addition to the weapon's weight, some complaints were lodged against the tripod of the Hotchkiss. An officer of the 42nd Division stated the following:

During preparation for the operation at Suippe on the Champagne front, the machine-gunners found themselves handicapped with the Hotchkiss



U.S. Army Hotchkiss machine gun team. (National Archives)

Grouping of M1914 Hotchkiss machine gun accessories. Includes two wooden ammunition boxes (each holds 10 feed strips), empty feed strip, loaded feed strip (24 rounds), leather and chain mail shoulder protector (for carrying hot barrel), armorer's chest with combination tool, flash hider wrench, gas regulator, cleaning rods and brush, cartridge case remover, bolt take-down tool, spare recoil spring, oil can (marked "huile"), antiaircraft sights and assorted small pins, springs and extractors. (Robert G. Segel collection)

machine-gun tripod. The tripod could not be lowered enough to conceal the gun in a field of standing wheat. When mounted on the tripod it required two men to carry it and even with two men it could not be moved forward or backward without exposing the men.

Some Hotchkiss tripods in AEF service were modified in order to reduce the height. This was a fairly common modification and helped reduce the objectionable height of the weapon when mounted on the tripod.

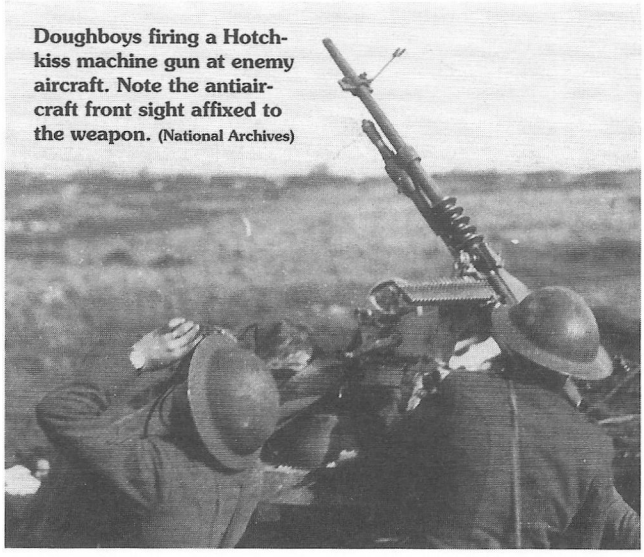
Some complaints were also made regarding the use of metal feed strips rather than cloth belts. Despite these problems, the Hotchkiss was reasonably popular with many Americans, as the complaints were overshadowed by the reliability and firepower of the weapon. The official history of the U.S. 77th Division contains a passage illustrative of the Hotchkiss' effectiveness in the hands of Doughboys:

...the Germans, hit from an unexpected quarter, were taken completely by surprise. Rodriguez gave them point-blank all the enfilade fire that a Hotchkiss at full speed can pour from its barrel. They dropped in rows...

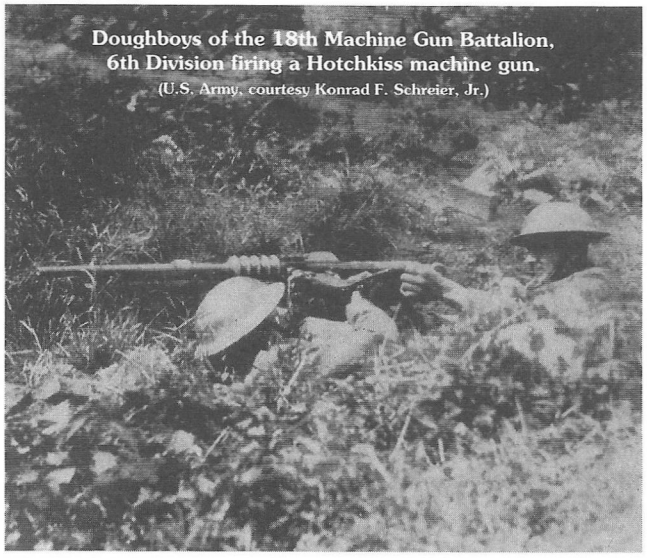
Another example of the Hotchkiss machine gun's effectiveness was related in a reported by a U.S. Marine Corps machine gun company commander, L.W.T. Waller who related:

Some 700-800 yards away from the edge of a small wood several companies of German infantry launched an attack on an adjacent (Marine) unit. The Hotchkiss guns were on the German left flank. The target was long and narrow...less than half the German unit reached the shelter of the woods.

Text continued on page 208.

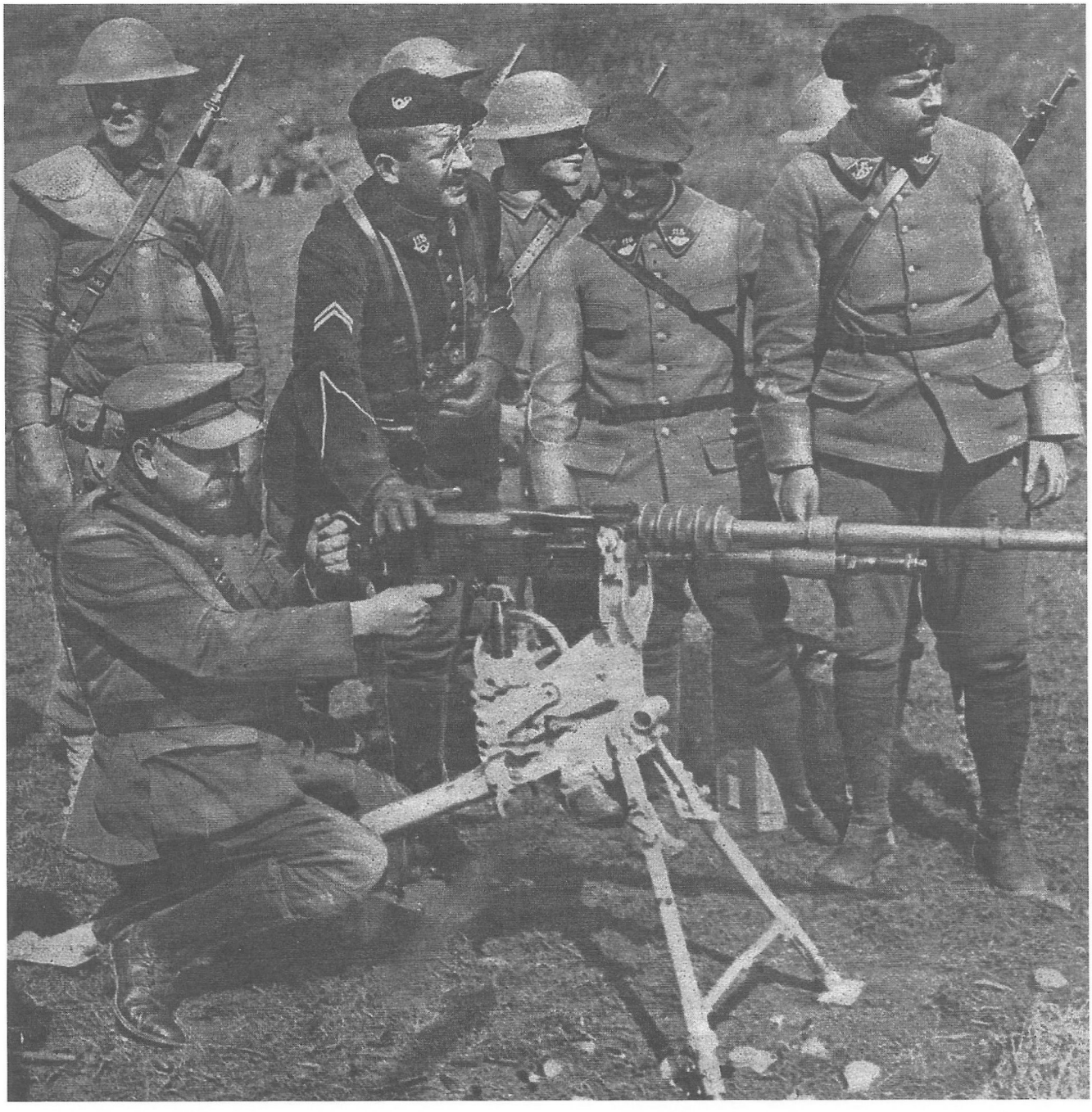


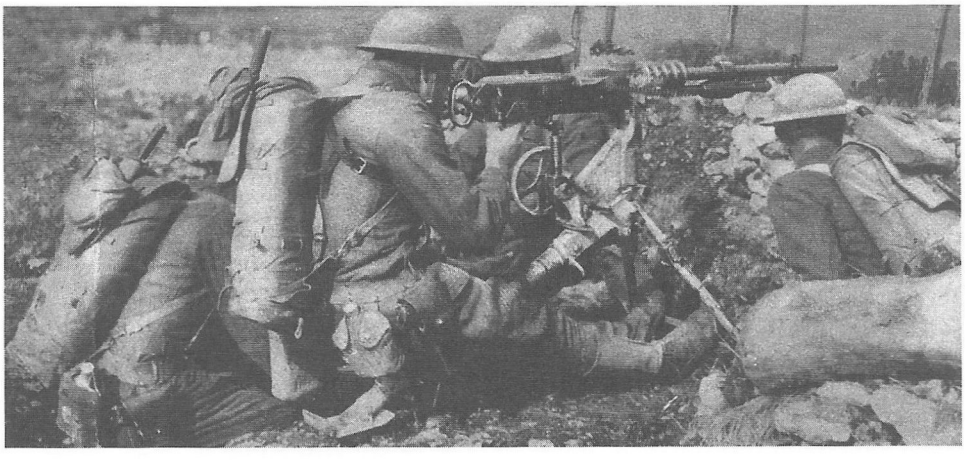
Doughboys firing a Hotchkiss machine gun at enemy aircraft. Note the antiaircraft front sight affixed to the weapon. (National Archives)



Doughboys of the 18th Machine Gun Battalion, 6th Division firing a Hotchkiss machine gun.
(U.S. Army, courtesy Konrad F. Schreier, Jr.)

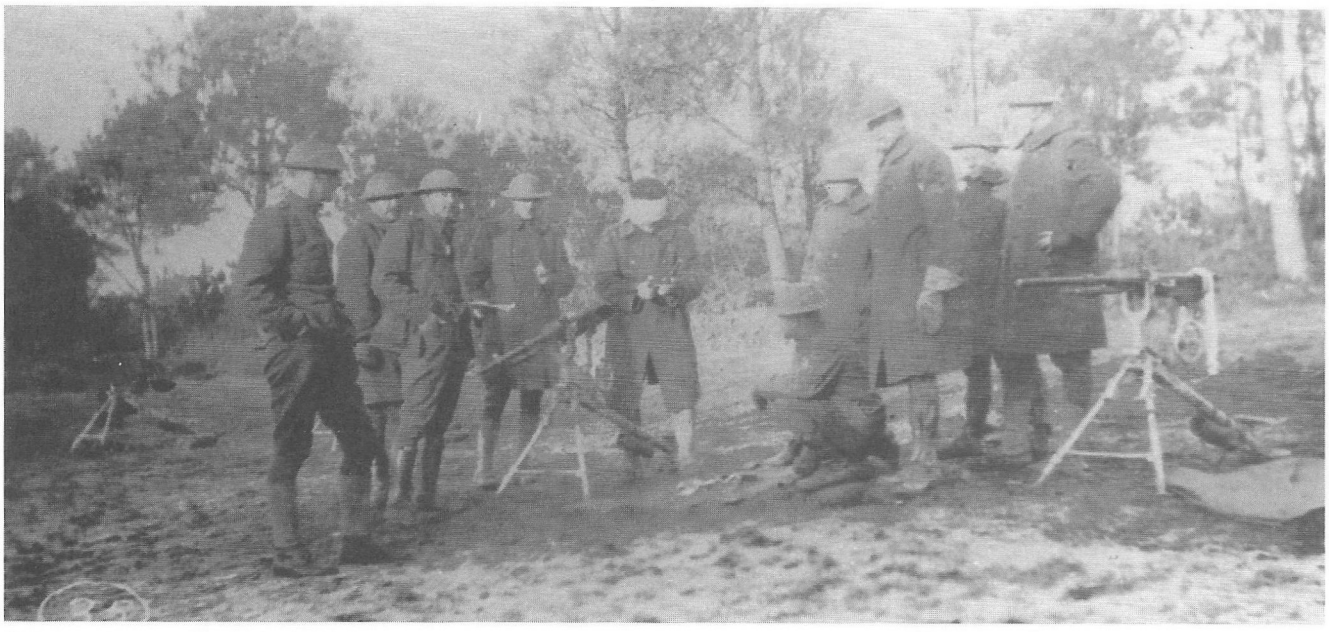
Left and right views of the Hotchkiss machine gun on a French M1916 tripod as modified and lowered by AEF mechanics.
(U.S. Army, courtesy of Konrad F. Schreier, Jr.)



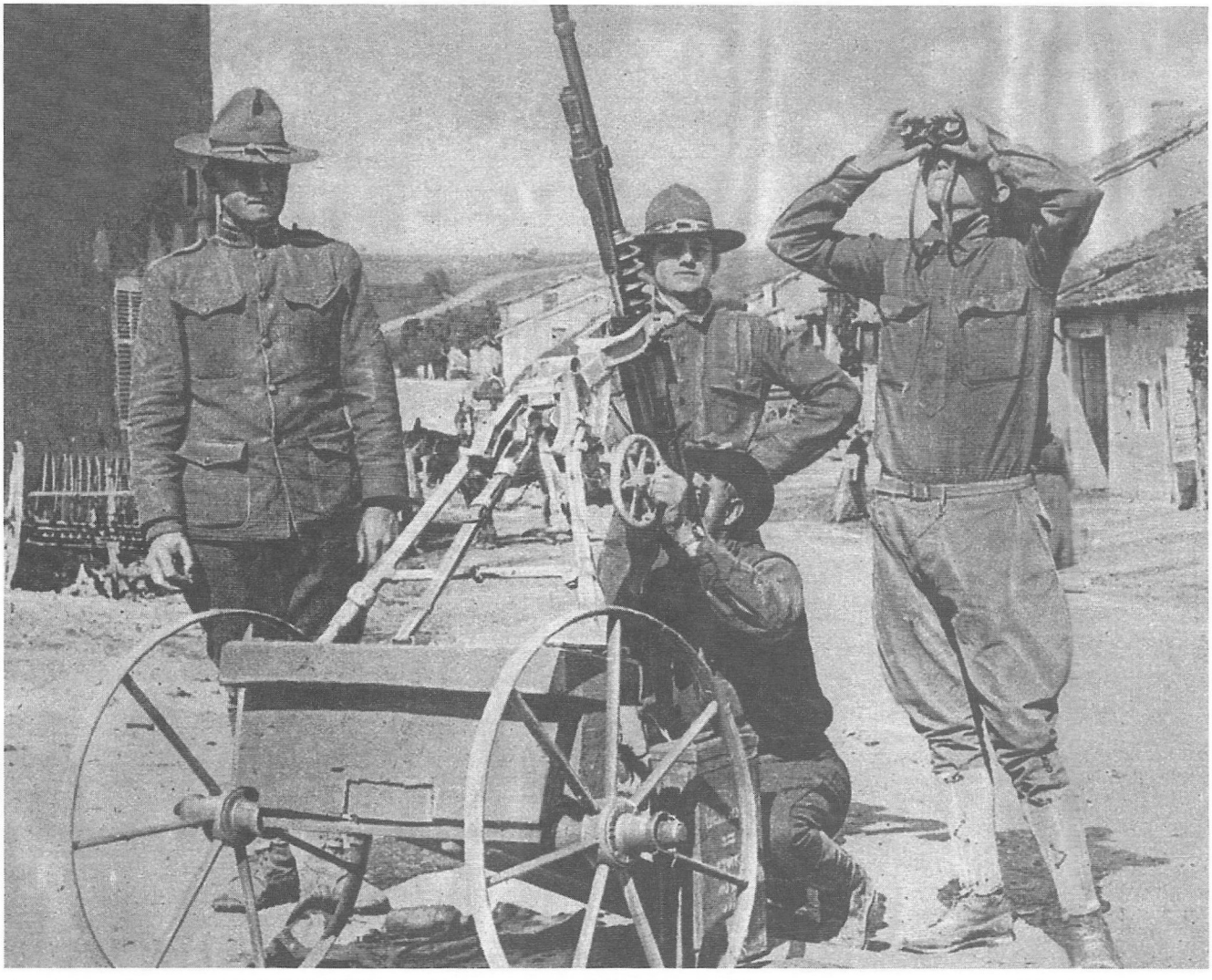


(above) Americans receiving instruction in the manipulation of a machine gun. Note standing soldier on left wearing chain mail over asbestos and leather shoulderpad for carrying hot barrels. (U.S. Army)

(left) Soldiers operating a machine gun on the western front in France just before the beginning of Foch's great counterattack that drove the German armies back toward the frontier. (U.S. Army)



U.S. gunners with Hotchkiss M1914s in late 1917. (U.S. Army, courtesy of Konrad F. Schreier, Jr.)



American troops firing a M1914 Hotchkiss machine gun in an antiaircraft mode. The gun is mounted on a makeshift wheeled carriage. (Robert G. Segel collection)

Text continued from page 205.

Probably the most famous use of the Hotchkiss machine gun by Americans occurred during the Battle of Chateau-Thierry on May 27, 1918, when the motorized 7th Machine Gun Battalion of the U.S. 3rd Division stopped the German offensive cold.

It may be surprising to some, but the M1914 Hotchkiss was the most widely used machine gun of the First World War by the AEF, with some 5,255 being procured during the war. While this number was less than the total of Browning and Vickers machine guns eventually manufactured, these weapons did not see as much front-line combat use in the hands of the Doughboys as did the Hotchkiss.

Doughboy Hotchkiss machine gun team in action, France, 1918. (U.S. Army)

U.S. troops with 1914 Hotchkiss elevated for antiaircraft fire.

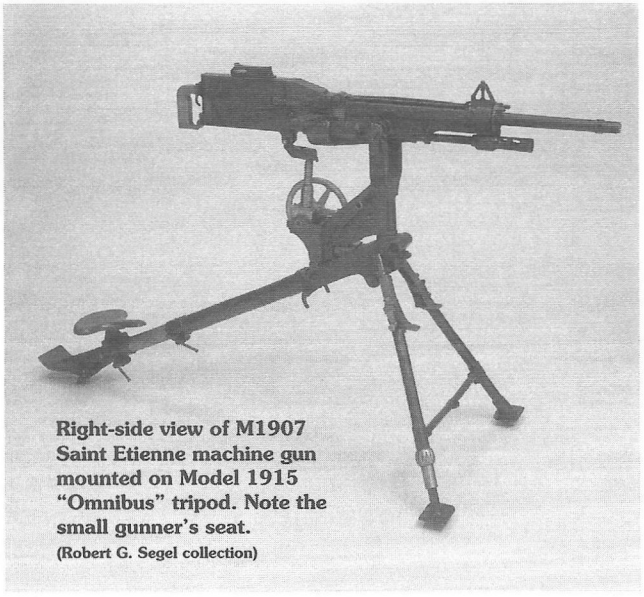
U.S. troops firing a Hotchkiss in the antiaircraft mode. (U.S. Army)

However, unlike other machine guns such as the Vickers and Browning, the Hotchkiss did not remain in the United States' inventory after the Armistice. The Hotchkiss was a perfect example of an allied weapon that was used by necessity by the Doughboys and discarded immediately after the war to be replaced by better American-made arms. However, the Hotchkiss machine gun's contribution to the allied war effort in general, and the American effort in particular, should not be forgotten.

M1907 Saint Etienne Machine Gun

This machine gun was designed by a team working at the French government arsenal at Saint Etienne. The weapon was conceived as an improvement over the original Hotchkiss design. The gun shared the air-cooled operation of the Hotchkiss but had an overly complicated "rack and pinion" operating mechanism. An exposed "return spring" was located underneath the barrel.

French 1907 Saint Etienne in 1915. The soldier at bottom holds a fresh strip of cartridges. (Robert G. Segel collection)

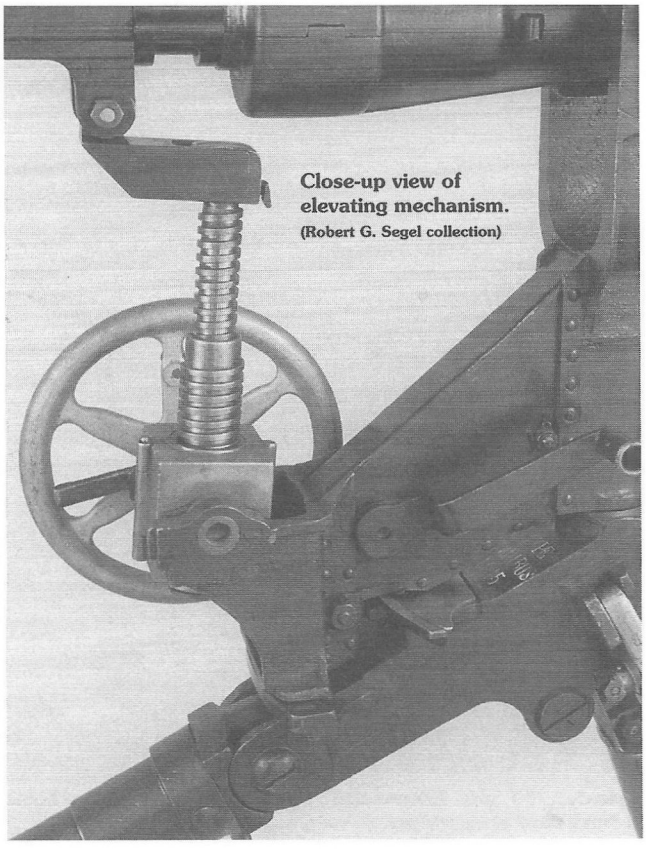


Right-side view of M1907 Saint Etienne machine gun mounted on Model 1915 "Omnibus" tripod. Note the small gunner's seat.
(Robert G. Segel collection)

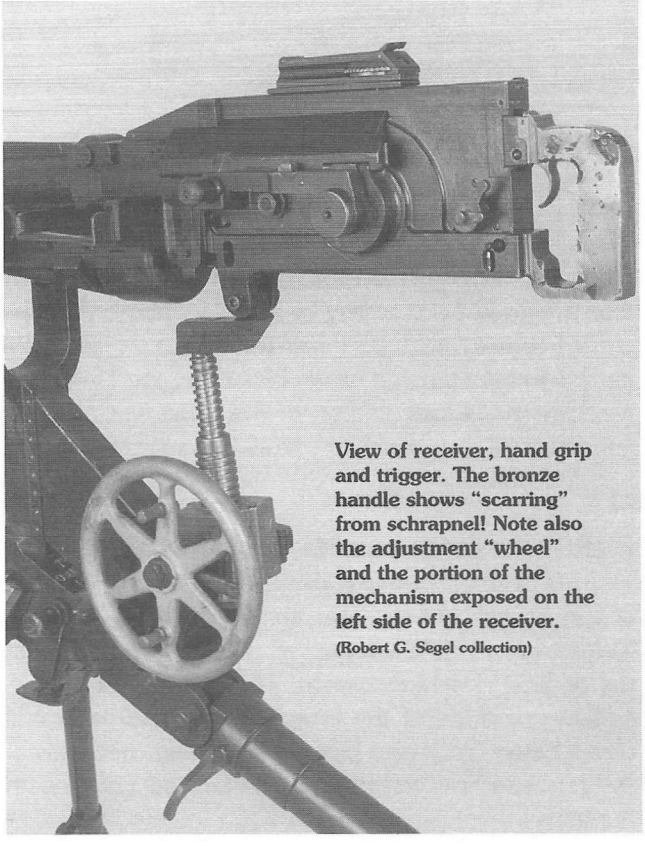
Left-side view of French M1907 Saint Etienne machine gun. Note cartridge feed strip inserted in receiver.
(Robert G. Segel collection)

Receiver markings on M1907 Saint Etienne machine gun. This example, serial number 7522, was made in 1916. (Robert G. Segel collection)

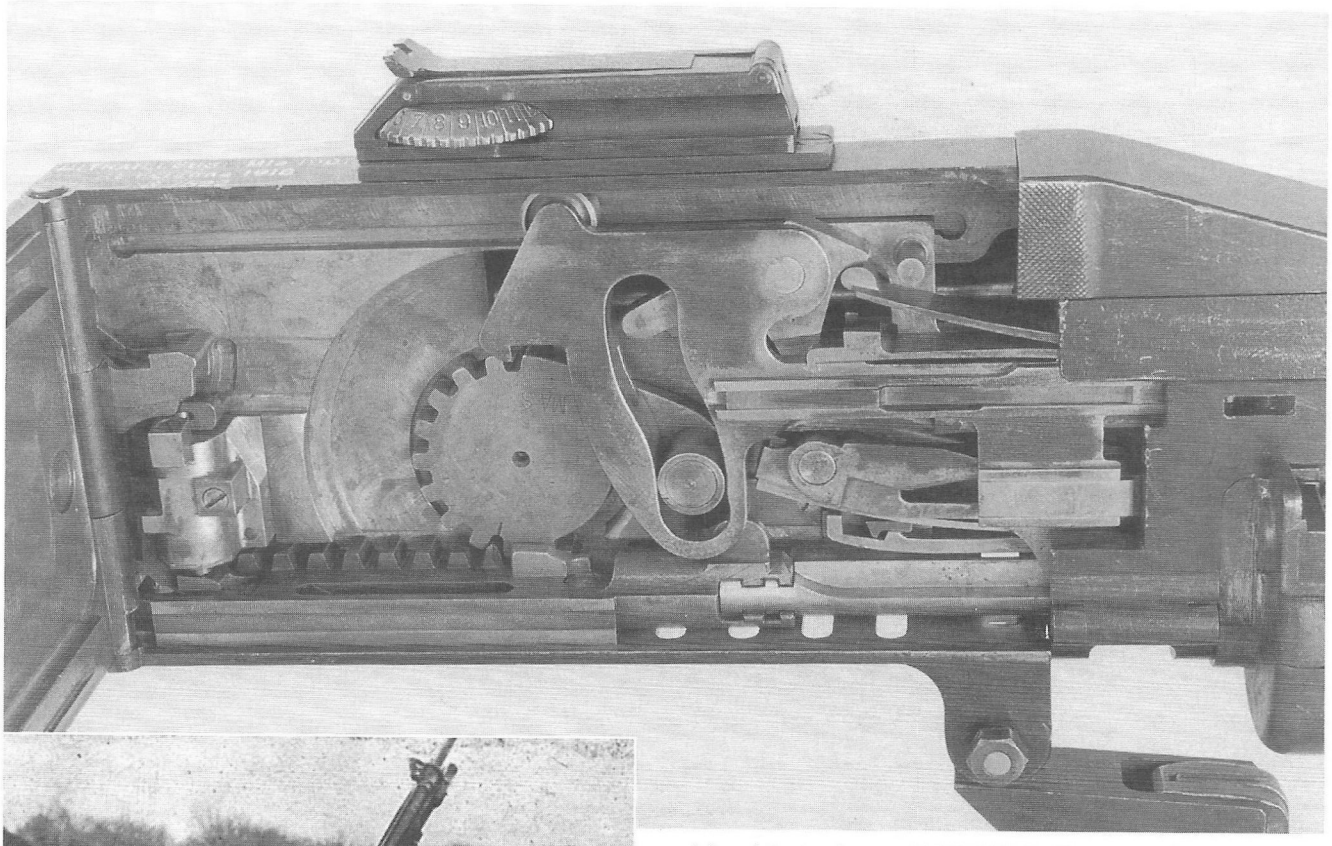
Markings on M1915 "Omnibus" tripod used with M1907 Saint Etienne machine gun.
(Robert G. Segel collection)



Close-up view of elevating mechanism.
(Robert G. Segel collection)



View of receiver, hand grip and trigger. The bronze handle shows "scarring" from schrapnel! Note also the adjustment "wheel" and the portion of the mechanism exposed on the left side of the receiver.
(Robert G. Segel collection)



(above) Internal view of M1907 Saint Etienne machine gun showing the overly complicated "blow forward" mechanism.
(Robert G. Segel collection)

(left) U.S. soldier using Saint Etienne with adaptor for regular mount to fire in the antiaircraft mode while guarding an airfield.
(Robert G. Segel collection)

When the M1907 Saint Etienne machine gun was fielded in the trenches during WWI, the design deficiencies soon became apparent. The mechanism easily became clogged with mud, and the hot barrel often caused the return spring to lose its temper. It was obvious that the weapon was anything but an improvement over the Hotchkiss machine gun. The M1907 Saint Etienne machine gun was withdrawn from front-line service and relegated to duty in France's North African colonies where the air-cooled design was considered an advantage.

A few Saint Etienne machine guns were used by Doughboys training with French units and also by black Americans serving with their colonial forces. However, such use of the weapon was quite limited and it saw little use during the war by our troops. The Hotchkiss was the only French heavy machine gun to see widespread service by the Doughboys.

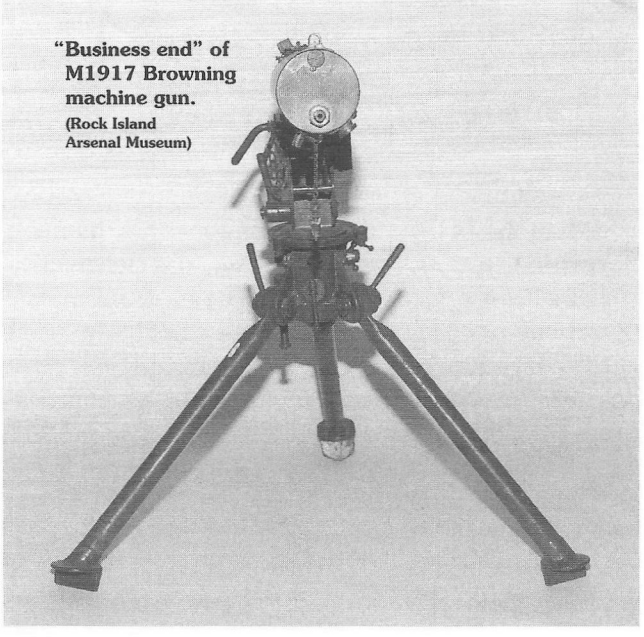
M1917 Browning Machine Gun

While the Hotchkiss was the most widely used machine gun of WWI by the Americans, the best machine gun of the war was a home-grown design, the Browning caliber .30 Model of 1917. Designed by the legendary John M. Browning, the basic M1917 design proved to be a remarkably utilitarian concept, and variants of the weapon remain in use even today.

John Browning demonstrated his heavy machine gun on February 27, 1917, at the same time he introduced his automatic rifle (BAR). While the War Department immediately ordered the BAR into production, there were further tests scheduled for the heavy machine gun, despite its impressive performance. The declaration of war a few months later

Left-side view of M1917 Browning .30 caliber water-cooled machine gun mounted on M1917 tripod. This specimen is not fitted with the water chest and hose or flash hider. (Rock Island Arsenal Museum)

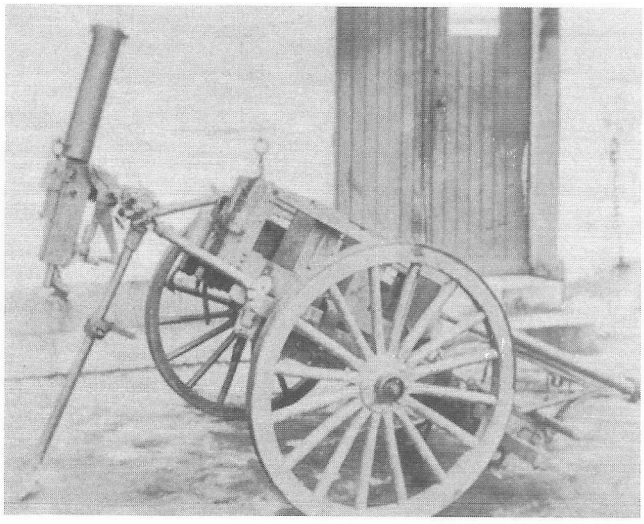
Quarter rear view. Note the pistol grip and windage/elevation adjustment mechanism.
(Rock Island Arsenal Museum)



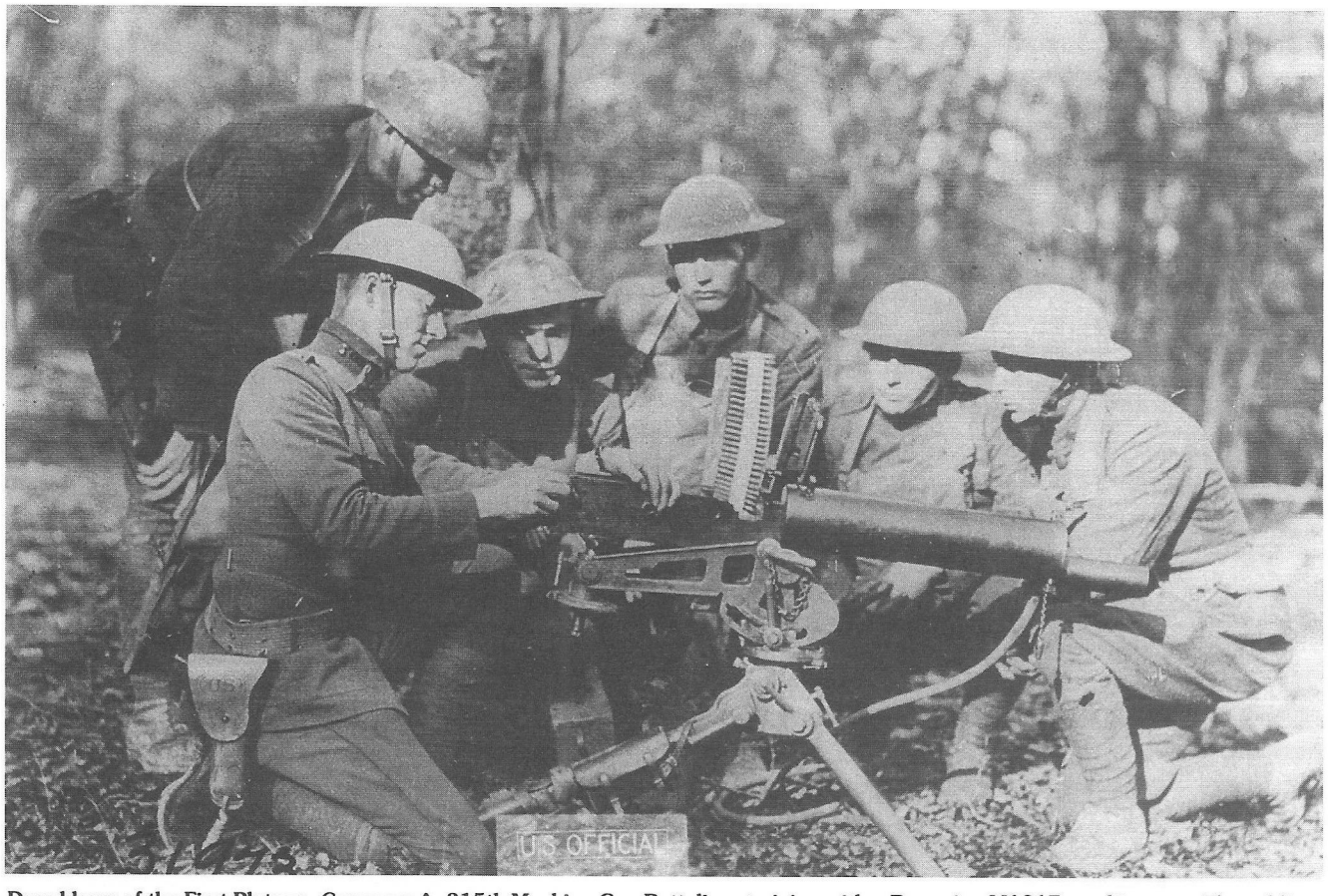
"Business end" of M1917 Browning machine gun.
(Rock Island Arsenal Museum)

resulted in an official test of the Browning machine gun held at Springfield Armory in May of 1917. The tests confirmed the brilliance of Browning's design, and the weapon was adopted as the "Browning Machine gun, Caliber .30, Model of 1917" and ordered into production. The Browning M1917 machine gun was chambered for the standard M1906 (.30-06) cartridge and fired at a rate of approximately 500 rounds per minute from a canvas belt holding 250 rounds. The water-cooled, recoil-operated weapon weighed 28 pounds with an empty water jacket and 34 pounds, 8 ounces with the jacket filled. The 250-round belts weighed 15 pounds each. The M1917 tripod weighed 50 pounds. There were actually three different tripods used with the M1917 Browning machine gun during WWI. The first, and most widely used type, was the M1917 tripod. In addition, the M1915 U.S. Vickers (Mark IV) tripod was used at times with the Browning. An experimental "Model of 1918" tripod was also fabricated in limited numbers. However, it was not a good design, and none were used in combat. The M1917 Browning was also transported in the same type of horse-drawn "voiturette" machine gun cart used with the Vickers, Colt and Lewis weapons.

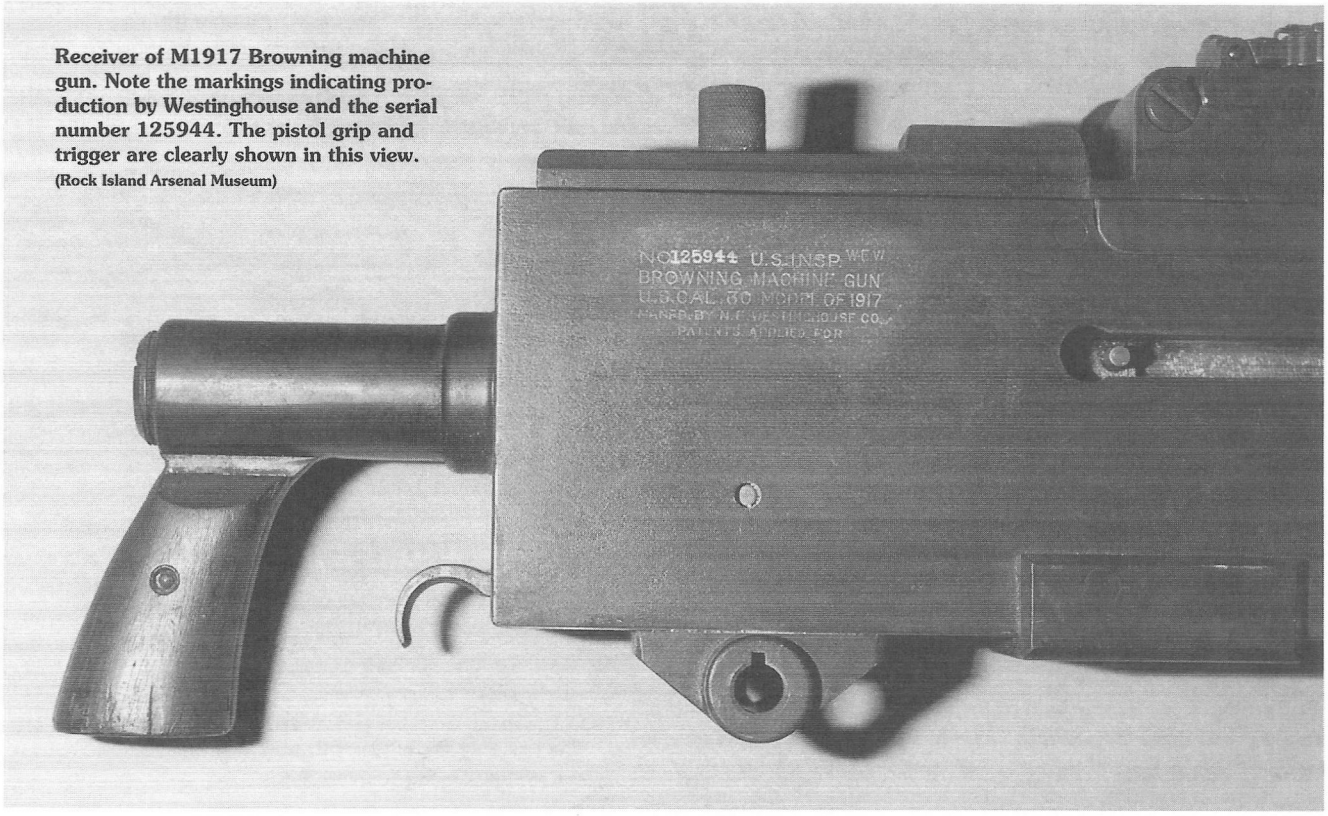
As with most of John Browning's designs, the M1917 machine gun was noted for its simplicity and



M1917 Browning machine gun mounted on M1917 machine gun cart. The gun is in the antiaircraft position. (U.S. Army, courtesy of Konrad F. Schreier, Jr.)



Doughboys of the First Platoon, Company A, 315th Machine Gun Battalion, training with a Browning M1917 machine gun. The soldiers are being instructed by Second Lt. Val. A. Browning, son of the weapon's inventor, John M. Browning. Note the weapon is equipped with a flash hider. Photo is dated October 29, 1918. (National Archives)



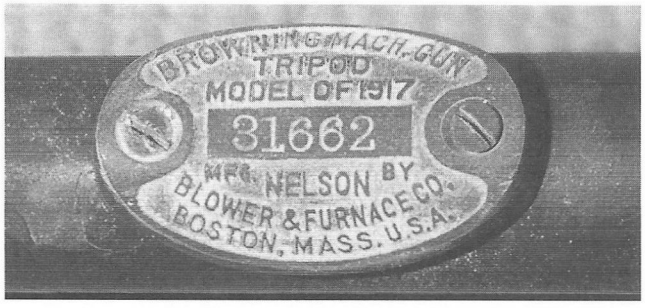
Receiver of M1917 Browning machine gun. Note the markings indicating production by Westinghouse and the serial number 125944. The pistol grip and trigger are clearly shown in this view. (Rock Island Arsenal Museum)

reliability. Compared to contemporary machine guns, the Browning was quite easy to disassemble with only a simple combination tool. This was one of the features that impressed the ordnance people during the weapon's initial testing, along with several other machine guns, at Springfield Armory. An article in the July 1918 issue of *Illustrated World* on "The Best Machine Guns in the World," contained the following:

One of the guns at the trials was accompanied by a formidable kit of tools in a box. An officer asked Browning where the tools for the Browning gun were and where he wanted them put. He (Browning) smiled a sad sort of smile and reached in his vest pocket and pulled out a device which was about the size of a fountain pen. With this device and an empty shell, he dismounted both guns (the heavy machine gun and BAR) and put them together again.

In order to maximize production of the new M1917 Browning machine gun, three firms were awarded contracts to manufacture the weapon. These were Colt, Remington and Westinghouse. Total production by the time of the Armistice was just under 43,000 guns as follows:

Westinghouse	30,150
Remington	12,000
Colt	600



(above) Data plate attached to M1917 tripod made for the Browning machine gun. This example was made by the Nelson Blower & Furnace Co. of Boston, Mass. The serial number is 31662. (Rock Island Arsenal Museum)

(below) Troops of the 339th Machine Gun Battalion, Company A, firing a M1917 Browning machine gun on the Rhone-Rhine Canal, October 29, 1918. (U.S. Army, courtesy of Konrad F. Schreier, Jr.)

Of this number, some 30,089 M1917 Browning machine guns had been sent to France before the end of the war. However, only 1,168 of this number actually made it into the front lines before of the Armistice. The weapon's first recorded use in combat occurred on September 26, 1918, in the hands of the 78th Division. The commanding officer of the division's machine gun detachment made the following report to General Pershing:

During the five days that my four guns (M1917 Brownings) were in action, they fired approximately 13,000 rounds of ammunition. They had very rough handling due to the fact that the infantry made constant halts, causing the guns to be placed in the mud. The condition of the ground on these five days was very muddy, and considerable grit and other foreign material got into the working parts of the gun. The guns became rusty on the outside due to the rain and wet weather, but in every instance when the guns were called upon to fire, they fired perfectly. During all this time I had only one stoppage, and this was due to a broken ejector.

Another report from an AEF officer regarding the Browning machine gun's excellent performance is contained in *America's Munitions*:

These guns (heavy Brownings) went into the front lines for the first time in the night of September 13. The sector was quiet and the guns were practically not used at all until the advance, starting September 26. In the action which followed, the guns were used on several occasions for overhead fire, one company firing 10,000 rounds per gun into

Right-side view of M1917 Browning machine gun and tripod.
(Rock Island Arsenal Museum)

M1917 Browning machine gun being fired by a machine gun battalion of the 80th Division, Meuse, France, October of 1918. Note the attached flash hider. (U.S. Army, courtesy of Konrad F. Schreier, Jr.)

a wood in which there were enemy machine-gun nests, at a range of 2,000 meters. Although the conditions were extremely unfavorable for machine guns on account of rain and mud, the guns performed well. Machine-gun officers reported that during the engagement the guns came up to the fullest expectations and, even though covered with rust and using muddy ammunition, they functioned whenever called upon to do so.

After the division had been relieved, 17 guns from one company were sent in for my inspection. One of these had been struck by shrapnel, which punctured the water jacket. All of the guns were completely coated with mud and rust on the outside, but the mechanism was fairly clean. Without touching them or cleaning them in any way, except to run a rod through the bore, a belt of 250 rounds was fired from each without a single stoppage of any kind.

It can be concluded from the try-out in this division that the gun in its operation and functioning when handled by men in the field is a success.

The outstanding performance of the M1917 Browning was echoed in the postwar recollections of General Hunter Liggett:

...The American Army used the Hotchkiss, bought from the French, until our Brownings arrived. The Browning was the most dependable and foolproof of all — French, German or British...the best machine gun that appeared in the war...

If the war had lasted even a couple more months, the M1917 Browning would have replaced most of the other machine guns in use by the Americans. However, the weapon only saw limited use for about two months before the war came to an end. Even in that brief span of time, the weapon proved itself as the best machine gun of the war and was firmly established as America's postwar heavy machine gun. Large numbers of slightly modified Browning machine guns saw widespread service in WWII and Korea. Most of the First World War vintage Browning M1917 machine guns were rebuilt in the 1930s, primarily at Rock Island Arsenal, to the later M1917A1 specifications.

The M1917 Browning was yet another chapter in the list of outstanding weapons invented in the fertile mind of John Browning. It is sometimes difficult to reach a consensus on which is the "best" weapon of a particular category. However, few would argue that the M1917 Browning was not the best machine gun of the First World War. The weapon, and its subsequent variants, is arguably the best machine gun design of all time. Not bad for a weapon that first saw use in the hands of the Doughboys in the trenches of France over eighty years ago.

.50 Caliber Machine Guns

In addition to the standard .30 caliber M1917, John Browning developed several prototypes of his machine gun chambered for a powerful .50 caliber round. The heavy .50 caliber round was intended to serve as an antitank as well as an antiaircraft weapon. The Browning's .50 caliber machine gun prototypes were essentially scaled-up and strengthened versions of his standard M1917 .30 caliber weapons. The war ended before any of the .50 Brownings could be manufactured or fielded, but the weapon became the standard postwar heavy machine gun. It is a vivid testament to the genius of John Browning that his basic .50 caliber machine gun design remains in front-line military use by the United States even today!

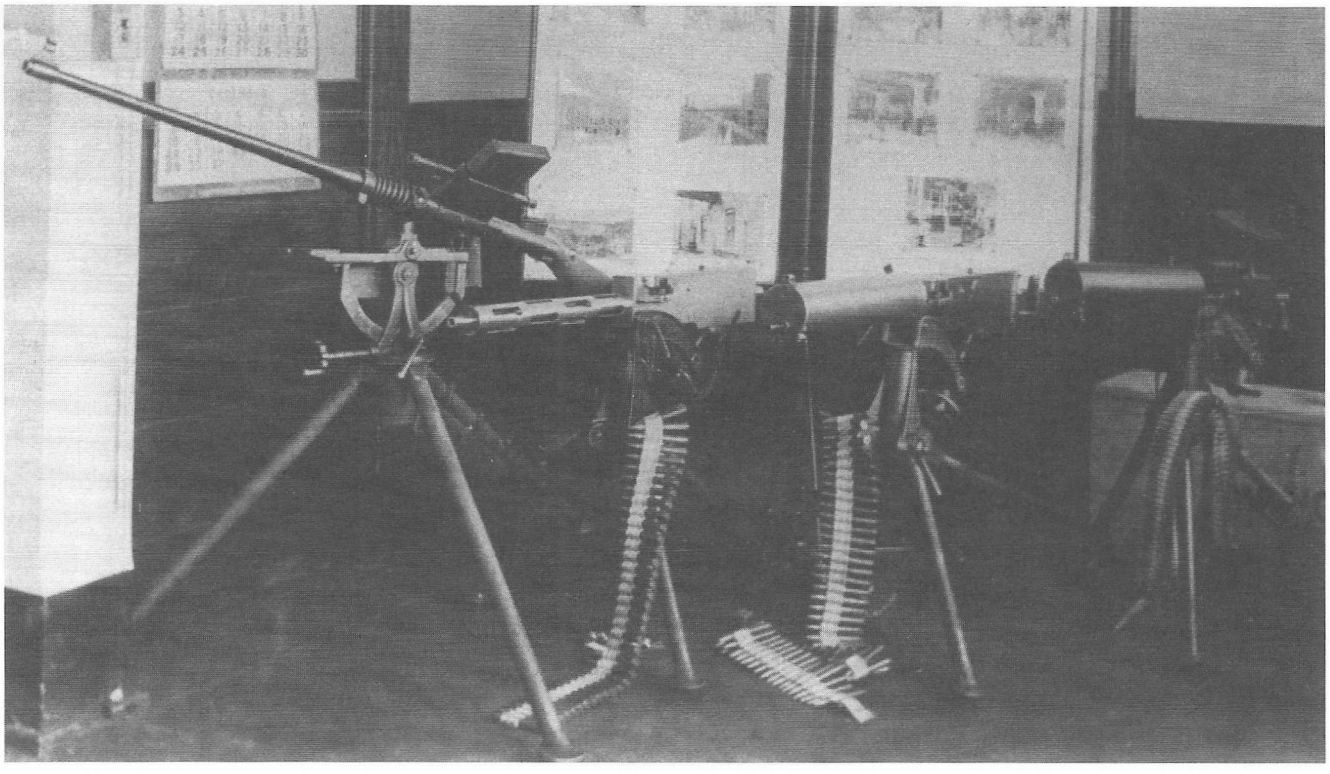
Winchester .50 Caliber Antitank Rifle

While on the subject of .50 caliber weapons, mention should be made of an unusual prototype antitank rifle developed late in WWI. Although the M1916 37mm gun served as the United States Army's primary antitank weapon from the time of its adoption until the eve of the Second World War, it was felt that a smaller and more portable arm of this type would be desirable.

A virtually unknown antitank rifle was developed by Winchester Repeating Arms Company in mid-1918 and designated as the "Model 1918 .50 Caliber High Power Bolt Action Swivel Gun." Only one photograph has been published depicting this unusual weapon displayed in a conference room at the Winchester factory.

The weapon was apparently initially conceived as a test platform for the new .50 caliber gun cartridge developed for use with the Browning heavy machine gun. The original .50 caliber cartridge had a flanged case which was later changed to a rimless (cannelured) case. The test weapon was slightly modified to incorporate the newly designed cannelured cartridge and informally evaluated by the U.S. Army on November 2, 1918. The weapon had a very unusual one-piece bolt and a trigger that was housed in a pistol grip. The bolt was unlocked by rotating the grip away from the receiver which automatically cocked the weapon and ejected fired cartridge cases. The weapon fed from a 5-round magazine located at an angle on top of the receiver.

The First World War ended before the Winchester .50 caliber antitank rifle could be fully evaluated, and further development was dropped. After the war, there was no perceived need for such a weapon because the standard Browning .50 caliber machine gun could perform its role in a more effective and versatile manner.



Photograph taken by F.L. Humiston on November 27, 1918, of the conference room adjacent to the Winchester Company's Product Engineer's office. The "Model 1918 .50 caliber High Power Bolt Action Swivel Gun" is to be clearly seen at the left. The three machine guns shown are prototypes of John M. Browning's .50 caliber designs. (Olin Corporation photograph. Courtesy Herbert G. Houze)

Machine Gun Carts and Ammunition Carts

As mentioned, horse or mule-drawn carts were often used to transport machine guns and ammunition into the front-line positions. The standard machine gun cart used by the U.S. Army during WWI was the "Model of 1917." This cart was equipped with a chest to carry the machine gun with provision to accommodate a spare barrel and cleaning rod. The tripod was supported by metal supports secured by leather straps. A metal tool box was attached underneath the rear of the chassis. The tool box carried a variety of items including extra horse or mule shoes. The cart also had an ammunition rack that held ammo boxes.

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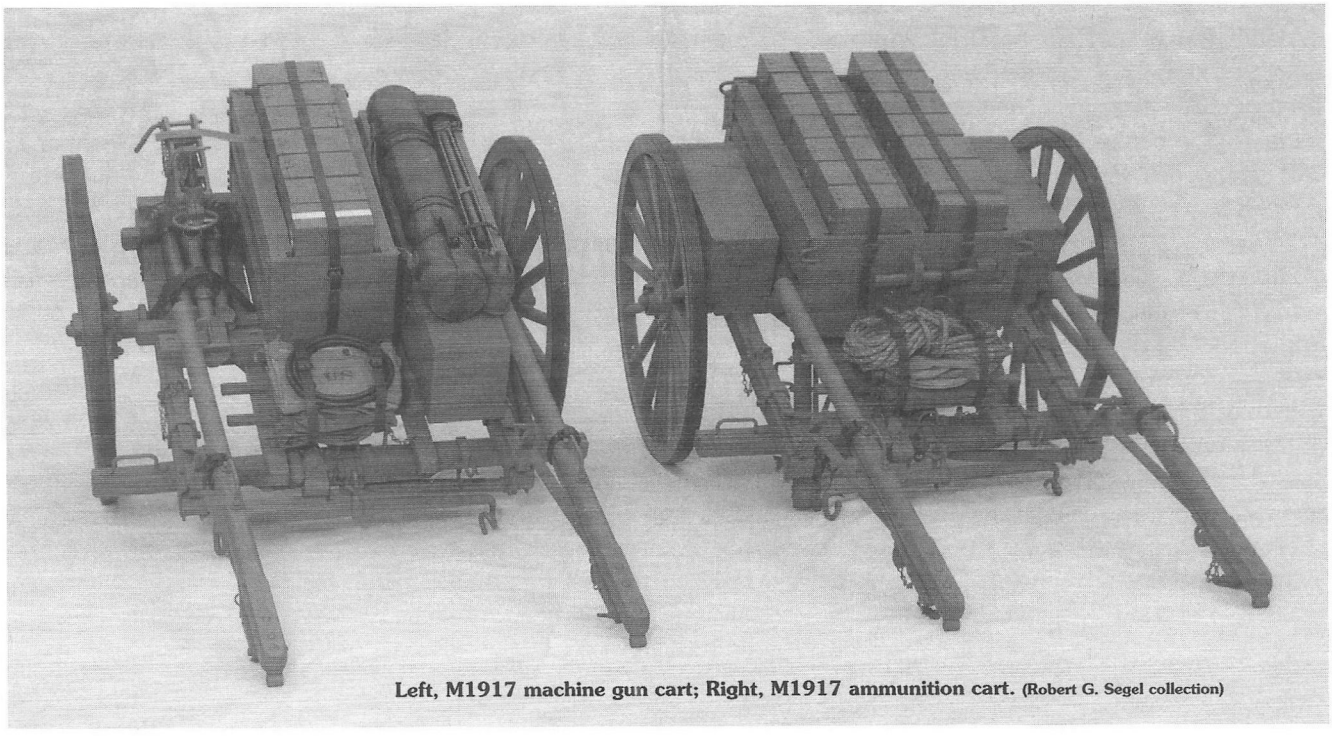
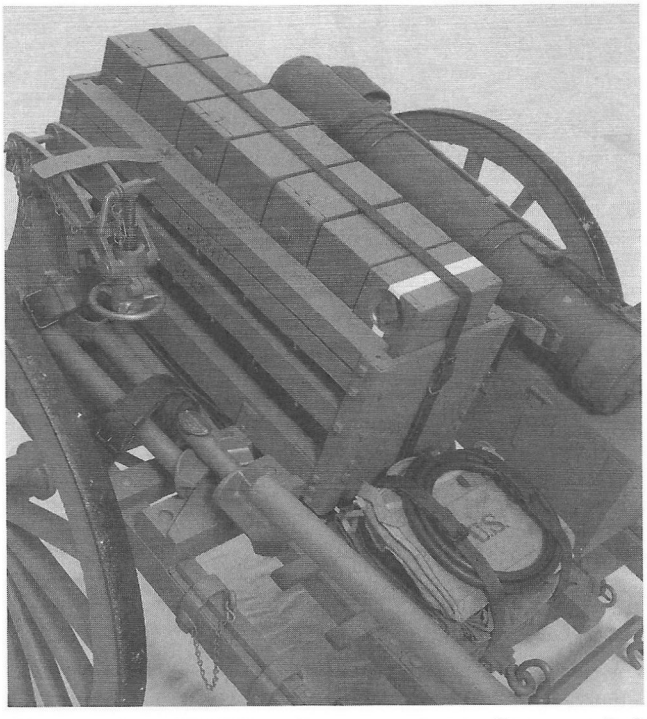


Left, M1917 machine gun cart; Right, M1917 ammunition cart. (Robert G. Segel collection)

Data plate for M1917 machine gun cart. (Robert G. Segel collection)

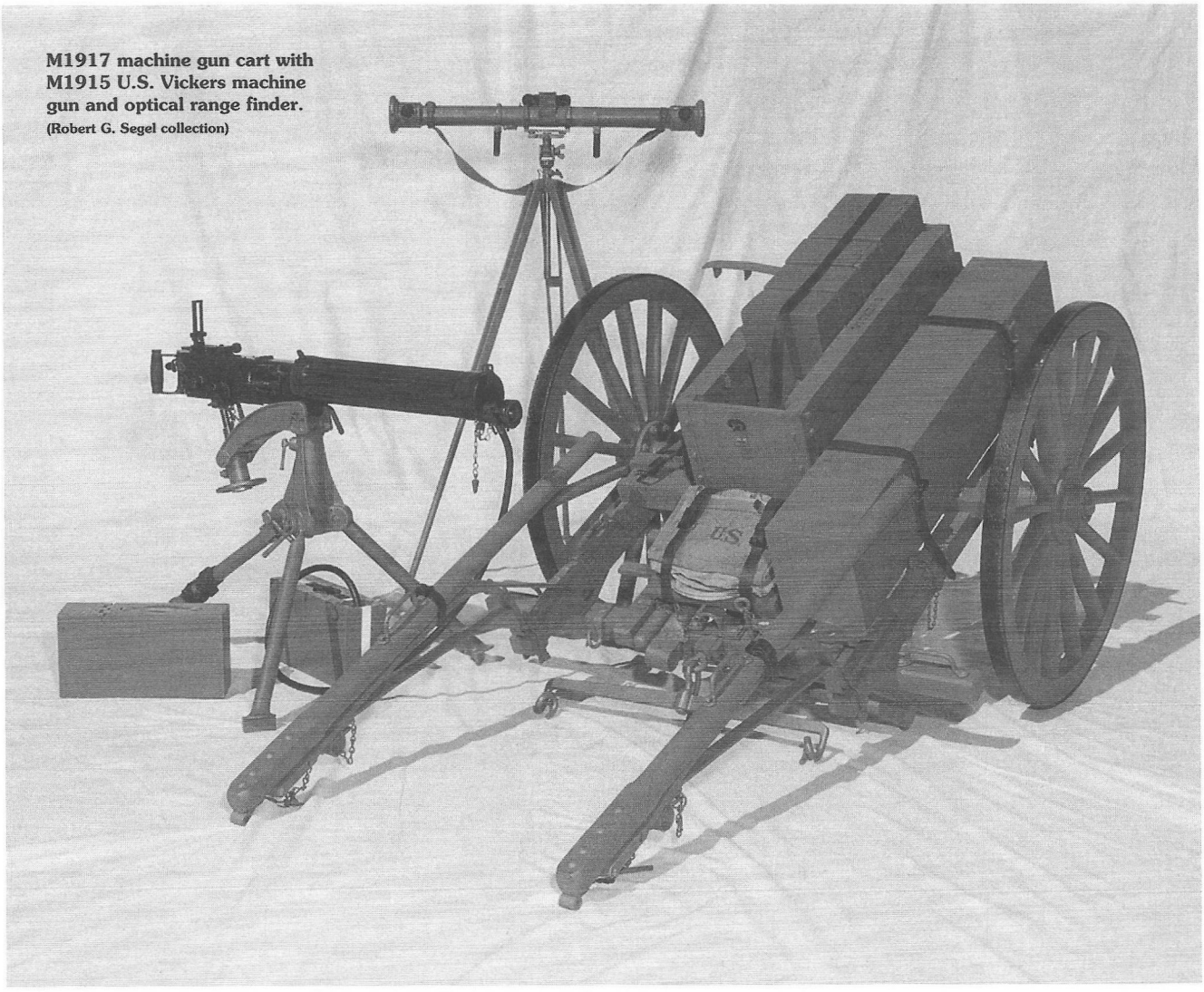
Data plate for M1917 ammunition cart. (Robert G. Segel collection)



Close-up view of M1917 machine gun cart with all items packed for transport. (Robert G. Segel collection)

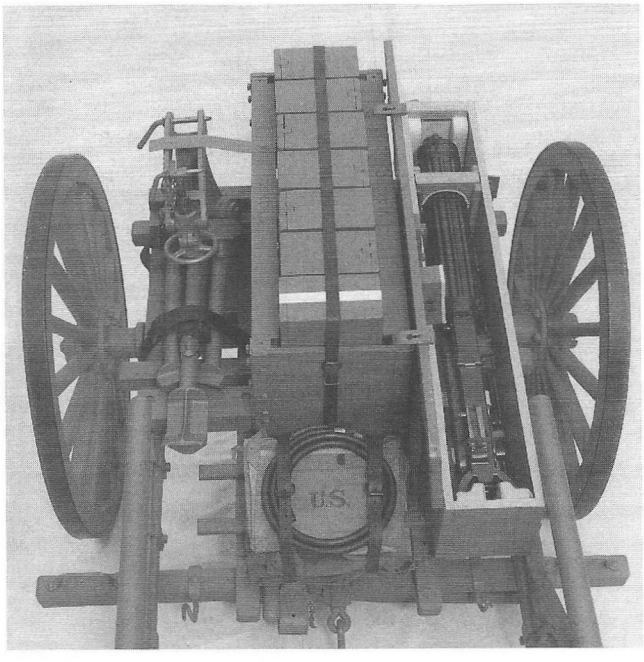
Grouping of various tools and accessories carried on cart.
(Robert G. Segel collection)

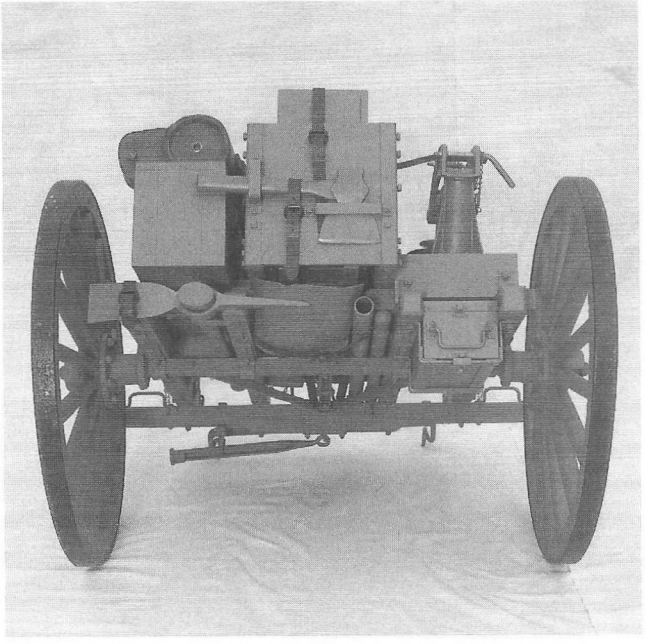
(below) U.S. Army machine gun unit training with M1917 carts.
(U.S. Army, courtesy Konrad F. Schreier, Jr.)



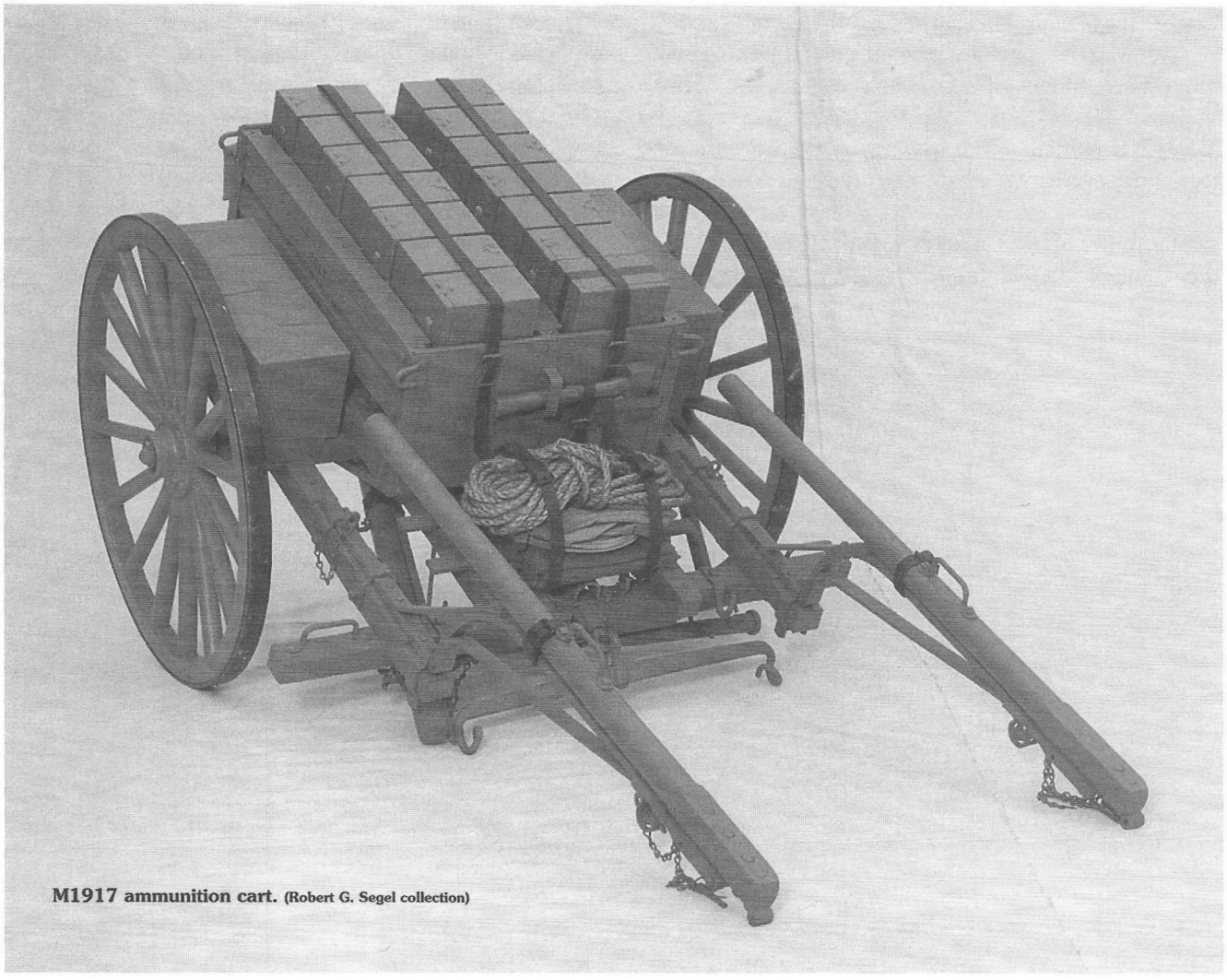
M1917 machine gun cart with M1915 U.S. Vickers machine gun and optical range finder. (Robert G. Segel collection)

Close-up view of M1915 Vickers machine gun in M1917 cart. (Robert G. Segel collection)

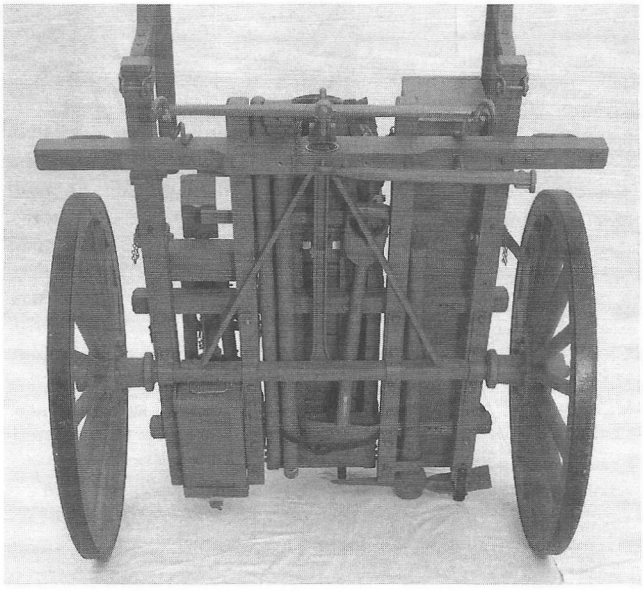




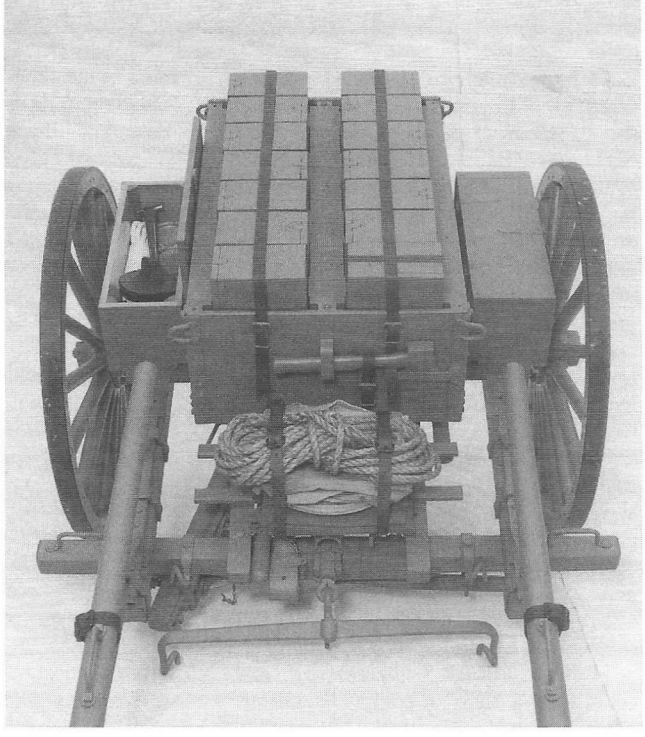
Rear view of M1917 machine gun cart. Note the "pioneer tools" (ax, pick, etc.) attached to the rear of the cart. (Robert G. Segel collecion)



M1917 ammunition cart. (Robert G. Segel collection)



(above) Underside view of M1917 machine gun cart. Note the attached shovel. (Robert G. Segel collection)



(right) Closer view of M1917 ammunition cart packed for transport. (Robert G. Segel collection)

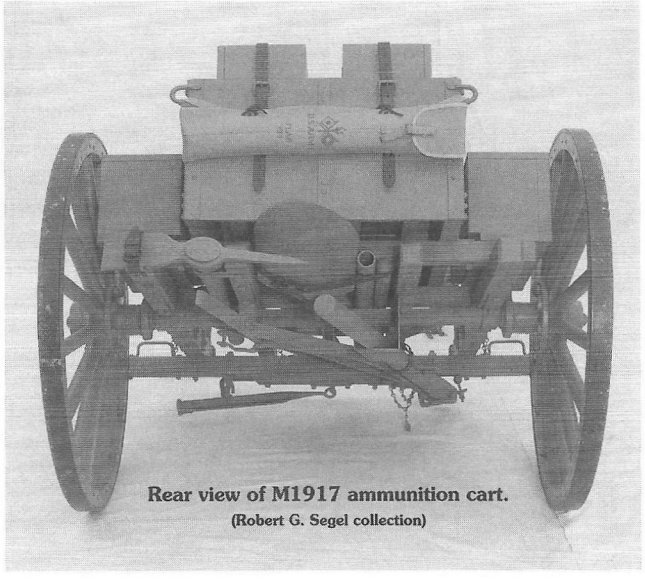
Text continued from page 218.

Water chests were also carried on the carts.

The M1917 machine gun cart could be used with four different types of U.S. machine guns; the M1915 Vickers, the M1914 Colt, the Lewis gun and the M1917 Browning. The type of tripod support used varied depending on which machine gun was carried.

The "Model of 1917" ammunition cart was very similar to the M1917 machine gun cart but different in the configuration of the various load-carrying racks. The ammunition cart had two racks that held up to fourteen boxes of ammunition and a belt-loading machine. Two tool chests were also fitted that could hold a variety of tools and miscellaneous equipment.

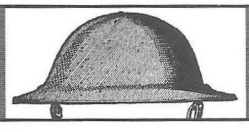
The Marine "Cole cart" was pulled by hand and was smaller and lighter than the Army's M1917 machine gun and ammunition carts. Surviving examples are rare, and these items are often overlooked when discussing the weapons of WWI.



Rear view of M1917 ammunition cart.
(Robert G. Segel collection)

(above) AEF machine gun unit with M1917 Carts in France, 1918. **(U.S. Army, courtesy Konrad F. Schreier, Jr.)**

Collector Notes



Like the automatic rifles discussed previously, all of the machine guns covered in this book are subject to provisions of the National Firearms Act (NFA) of 1934. Weapons not currently registered under the act are illegal to possess and cannot now be registered. Federal sanctions for unauthorized possession of such weapons are quite severe. Table #56 on page 278 gives specific information regarding the laws pertaining to such weapons.

Even though machine guns were perfectly legal to own in 1918–1919, relatively few were "smuggled" home by Doughboys. It was obviously easier to stick a M1911 Colt into a duffel back than a water-cooled Vickers machine gun or even a Chauchat automatic rifle. Nevertheless, some German and allied machine guns were crated and sent home as "souvenirs" of the war, and they were as legal to have as a trench knife.

Prior to the law being changed, one could have a "live" machine gun deactivated under the "Dewat" (Deactivated War Trophy) provision of the NFA. A "dewatted" machine gun had the bolt welded to the chamber and was, in theory, incapable of being fired. Guns modified in this manner were legal to own and could be subsequently transferred with no further restrictions after initial registration as a "dewat." However, it was eventually discovered that some "dewats" could be restored to firing condition with varying degrees of difficulty, and the program was halted. Guns that were legally registered as "dewats" can still be transferred after prior approval without having to pay the transfer tax as is the case of operational machine guns. Many of the machine guns brought home after WWI were "dewatted" after passage of the NFA in order to retain legal possession. Also, there have been "amnesty" periods in the past which allowed for previously unregistered machine guns to be legally registered with no questions asked. Again, some of the WWI machine guns that were previously unregistered were legally registered.

None of the machine guns of WWI are common today and finding original examples can be quite difficult. Some of the weapons made in fairly large numbers, such as the M1917 Browning, were used extensively after the war and most were later overhauled and modified from their original configuration. Relatively few of the foreign weapons such as the Hotchkiss and Chauchat were sent to the U.S. Of that small number, most were destroyed and few were left around to be subsequently registered. Despite the difficulty in finding original specimens, all of the WWI machine guns are extremely collectible and thoroughly fascinating weapons.

M1895/1914 Colt Machine Guns

The original early "potato digger" M1895 machine guns and the later WWI-era M1914/1917 variants are fairly uncommon today. The early guns cham-

bered for the .30-40 Krag, 6mm USN and .30-03 cartridges are the least common but none of these would be proper for a WWI collection.

The most important considerations (other than being sure the example is properly registered) are the overall condition, the degree of originality and the type of accessories included. Obviously, the better the condition, the higher the price. Many of these guns were well used in training, although some unissued examples in "mint" condition have been observed. One should be careful to determine that a gun hasn't been "rewatted." The chamber area should be examined very closely for signs of welding that has been subsequently removed. The bolt should also be looked at although it is possible that a replacement bolt was installed in place of the "rewatted" original.

Accessories such as ammunition boxes, cartridge belts, spare barrels, tool kits and manuals all add immeasurably to a weapon's desirability.

M1904 U.S. Maxim

One of the rarest United States machine guns is the M1904 U.S. Maxim. Guns of this type still in the original .30-03 chambering are incredibly rare but even the guns modified to .30-06 are not much easier to find. Only a small number (350) were made, and these were subjected to hard use during the war. Of this number, about 260 were made by Colt with the balance being obtained from the Vickers Co. Despite slightly larger numbers made, the Colt M1904 Maxims are the most highly prized. A genuine Colt-made M1904 machine gun is a beautifully crafted and finished weapon. The same caveats mentioned previously regarding "rewatted" guns and overall condition apply. However, any original M1904 U.S. Maxim is an incredible find, and few collections today can boast an example. The book *The Devil's Paintbrush* by Dolf Goldsmith is a recommended reference source on the subject of Maxim machine guns.

M1909 Benét-Mercie "Machine Rifle"

Although far from common, examples of the M1909 Benét-Mercie appear on the machine gun collector's market from time to time. There are two recognized variants of this weapon, the guns made by Colt and those made by Springfield Armory. Prices for the two variants seem to be about the same, given comparable degrees of condition and originality. The M1908 Warner & Swasey "musket sight" was issued with the M1909 Benét-Mercie. However, a number of examples extant are missing this sight which devalues the piece to some extent. The serial number of the weapon was stamped inside of the sight's dovetail recess. M1908 W&S sights issued with selected M1903 Springfields can be distinguished by the serial numbers. M1909 Benét-Mercie serial numbers will have a maximum of three digits while the '03 rifle serial numbers will have six digits. Unlike the M1903/M1908 W&S sniper rigs, many of the M1909 Benét-Mercie weapons will have M1908 W&S sights with matching serial numbers. However, some mismatched components have been noted. These are a bit less desirable than all-matching rigs, but the difference is not usually great.

The metal feed strips, particularly packed in the original wooden carrying cases, can be a bit difficult to find, and these items are eagerly sought after. Some examples of the M1909 Benét-Mercie weapons are missing their bipods, which also seriously devalues the weapon. Replacement bipods are virtually impossible to find, so restoration is quite difficult. No reproduction bipods have been observed, but the possibility always exists that a replica could be made to restore a missing example. Any bipod that appears non-standard and on which the finish seems too new for the rest of the weapon should be looked at very closely.

As is the case with the other WWI machine guns, fake examples of M1909 Benét-Mercie guns are not a problem. A potential purchaser should be certain that a particular weapon has not been refinished nor has been "rewatted."

Although plagued by reliability problems, the M1909 Benét-Mercie machine guns were well crafted and finely finished weapons. They are historically significant weapons due to their utilization in the 1916 Mexican Punitive Expedition and their use in WWI. Any nice example is a wonderful addition to a collection and prices are sure to remain strong.

Lewis Gun

Lewis guns have always enjoyed a measure of collector popularity due to their unique appearance and mechanical features. The large top-mounted "pan" magazine and large barrel "radiator" makes an impressive display.

Most U.S. martial machine gun collectors prefer an example of the Savage-made M1917 Lewis gun in .30-06. This was the weapon used by the U.S. Marines during, and after, WWI although it was not utilized in combat. However, the .303 British Lewis guns are also popular with many collectors since a number of these weapons were used by Doughboys during the war. However, given comparable condition, the .30-06 Lewis guns will almost always bring a premium over the .303 guns on the American market today. In any event, either variant is an interesting and desirable collectible.

Other than the specific Model (M1917 .30-06 or M1916 .303 British), the most important consideration is the condition of the gun. Since many of the weapons remained in service following WWI, they were often subjected to hard use, so some well-worn examples may be encountered. Guns in excellent or better original condition will definitely bring a premium. Some Lewis guns were "dewatted" after the war, so evidence of "rewatting" must be considered.

A number of Lewis gun owners today enjoy shooting their weapons. Unless an example is in pristine condition, occasional firing will not harm the weapon if everything is in working operation. However, some spare parts such as the main "clock spring" are in short supply, so the joys of shooting the weapons should be balanced against the possibility of breaking a hard-to-replace part. On the other hand, these guns were made to be fired and, with careful use, shooting a Lewis gun is a real treat.

Among the most sought-after accessories are spare magazines and the carrying chests made for these items. Web gear such as magazine pouches are also popular with most collectors. Decent examples of such accessories should be obtained whenever possible. The best reference source on the subject is William Easterly's *The Belgian Rattlesnake.*

Original Lewis guns will continue to be desirable items for years to come, assuming the legal aspects of machine gun ownership remain unchanged.

Vickers Machine Guns

While not as rare as the M1904 U.S. Maxim, original M1915 Vickers machine guns are quite uncommon today. The fact that the weapons remained in the government's inventory after the war resulted in many being modified and, ultimately, destroyed after being declared obsolete. Original, unmodified examples are highly prized today. The British-made WWI-vintage .303 caliber Vickers are somewhat easier to find but, again, unmodified examples are far from common. The later variant WWII-vintage Vickers machine guns are more common, but these would not be proper for a WWI collection.

M1915 U.S. Vickers in presentable condition are impressive weapons. Like all Colt products, they are well made and attractively finished. The fluted water jacket instantly makes the Vickers recognizable from other water-cooled machine guns.

Price and demand for the Colt-made

M1915 U.S. Vickers are normally significantly greater than for the British-made guns. The cachet of the Colt name and the .30-06 caliber are indisputable "draws" for an American collector. However, either type (assuming they are still in original WWI configuration) would be correct for display in a U.S. WWI collection, since both types were used by Doughboys.

The same comments regarding "rewats" and overall condition as mentioned with the other machine guns discussed apply to the Vickers as well. However, as stated, many of these guns that remained in U.S. service after the war were subjected to some form of modification. Therefore, a collector should consult with someone knowledgeable on the subject to be certain that a weapon hasn't been altered. The book *Grand Old Lady of No Man's Land* by Dolf L. Goldsmith is a recommended reference source on Vickers machine guns.

As is always the case, a modified weapon may still be a good collectible, but it isn't as valuable or desirable as an all-original weapon. While finding a good example of a WWI Vickers machine gun is not an easy task, the search is well worth the effort. The Vickers is a classic WWI weapon and an eminently collectible arm.

M1907 Saint Etienne Machine Gun

Examples of the French M1907 Saint Etienne machine gun are not very common. As discussed, the weapon did not see widespread use by the French during WWI, and very few of the weapons were ever employed by the Doughboys. Nevertheless, a properly registered example would be an interesting and valuable collectible of a little-known WWI-era machine gun. The primary collector caveat would be to determine whether or not an example was originally a "dewatted" gun that was subsequently "rewatted." Such guns would have somewhat less collector value than an original and untouched example, but any presentable Saint Etienne machine gun is a good find.

M1914 Hotchkiss Machine Gun

Another difficult to find, but extremely interesting, weapon is the French M1914 Hotchkiss machine gun. Even though the weapons are uncommon on the market today, they invariably remain in their original configuration since almost none were modified after they arrived in the United States. As with the other machine guns we have discussed, one should always determine that a Hotchkiss has not been previously "dewatted." A number of Hotchkiss that were shipped home after the war as "trophies" were, in fact, "dewatted" to keep them legal after the laws changed in the 1930s.

Given the weight of the weapon, not a large number of Hotchkiss machine guns were sent to the United States after the war. The guns of this type that were used for training purpose stateside were disposed of soon after the war, since it was not feasible to convert the 8mm guns to .30-06 caliber.

A complete M1914 Hotchkiss and tripod would be a wonderful display item in a WWI U.S. collection since the weapon was the most widely used machine gun of the AEF. The weapon's unique appearance and size are impressive and never fails to attract attention. All M1914 Hotchkiss machine guns were of French manufacture and there are no major collector variants. The standard French tripod and the tripods modified by the AEF to reduce the height seem to be about equal in value. However, the latter is probably better suited for display in a U.S. WWI collection, since it indicates that the weapon (or at least the tripod) actually saw use by American troops during the war.

Even though the weapon was only made by the French, the Hotchkiss machine gun is, nevertheless, a key weapon of the Doughboys and is worthy of inclusion in any U.S. First World War collection. Fortunate is the collector who has an example of this thoroughly interesting and historic machine gun.

M1917 Browning Machine Gun

Although the M1917 Browning was the standard U.S. heavy machine gun after the war and remained in service for many years, unaltered examples are extremely rare. Even though fairly large numbers were manufactured, virtually all were subsequently rebuilt to the later M1917A1 configuration. There was a large-scale recall of M1917 machine guns to Rock Island Arsenal in the late 1930s in order to convert the weapons to the updated configuration. Therefore, only the weapons of this type that were removed from the "system" prior to this time were spared the overhaul process. Since the M1917 machine gun was standard issue during this period, none were released or declared as surplus.

The WWII and later M1917A1 and WWI-vintage M1917 machine guns modified to M1917A1 configuration are relatively easy to find on the collector market today. However, very few collections contain an example of an unmodified First World War vintage M1917 Browning.

The M1917 machine guns made by Remington and Westinghouse would be worth about the same, assuming comparable degrees of condition and originality. The M1917 Browning water-cooled machine guns made by Colt are extremely rare due to the much smaller number made. However, any unmodified M1917 Browning machine gun is a very rare and highly desirable weapon on today's market. Some M1917A1 machine guns were "demilled" by having the receiver side plate removed, thus rendering the weapon inoperable. It is possible that a M1917 machine gun may also be found in this condition. Some guns demilled in this manner have had newly made side plates installed (registered with BATF), thus allowing the guns to be restored to firing condition. The law no longer allows this to be done but many machine guns were restored with reproduction side plates. Some side plates were etched with the correct markings, so it is important to examine closely the finish of the side plate to be sure it matches the rest of the receiver. The method of riveting the side plate to the receiver should also be examined.

The various accessories made for the M1917 machine gun including tripod, ammunition boxes, water chests and belt-loading machines are all interesting and colorful items in a collection.

Original WWI M1917 Browning machine guns are surprisingly rare weapons, and very few will be found in collections. The modified M1917 machine guns and the later M1917A1 variants are much easier to find but are not correct for a WWI display. The M1917 Browning machine gun is the first variant of a weapon that was destined to serve the United States armed forces for over seventy-five years. Any original, unmodified example is truly a collector's prize.

.50 Caliber Prototype Weapons

Only a very few prototype .50 caliber machine guns were made during World War I and virtually none are around today outside of factory museums. There are no known examples of the unusual Winchester .50 caliber antitank rifle in existence today, so the odds of finding any such weapons are virtually zero. This fact, obviously, dampens any potential collector interest in such weapons.

Machine Gun and Ammunition Carts

Surviving examples of the M1917 machine gun and ammunition carts and the Cole handcarts are quite uncommon. Most were destroyed sometime after WWI when motor transport vehicles replaced the mule and horse-drawn carts. Any example would be wonderful find and a great adjunct to a WWI machine gun collection.

Grenades and Grenade Launchers

The use of hand grenades dates back to the 15th century. Grenades were extensively used for the next two hundred years, reaching a zenith in the late 17th century. The use of grenades was so ingrained in infantry units of the time that specially trained troops called "grenadiers" were an integral part of virtually every army. The improvement in firearms, however, resulted in decreasing emphasis on hand grenades, since it became difficult for the grenadiers to get close enough to the opposing infantry to lob their grenades. By the end of the 19th century, grenades had become virtually obsolete as tools of warfare. There was some sporadic limited use of hand grenades during the American Civil War and other conflicts, but the weapon was relegated to, at best, an auxiliary tool of war.

The newly dawned 20th century saw a renewed emphasis on hand grenades, which were used on some occasions during the Russo-Japanese War. Despite their successful use in that conflict, most of the military powers of the world had only a cursory interest in developing modern hand grenades. This was the situation at the start of the First World War. However, after the first battle of the Marne, fighting on the Western Front bogged down into protracted trench warfare. It was soon realized by even the most myopic military planner that hand grenades could be quite useful weapons for trench warfare. The value of grenades was discussed in a War Department Training Manual prepared at the Infantry School of Arms at Fort Sill, Oklahoma:

Grenades have now come to be universally regarded as indispensable both to attack and defense, and the French authorities consider that the grenade has to a great extent supplanted the rifle as an offensive weapon in trench warfare.

The unique nature of trench warfare made the utilization of grenades a logical step. As stated in the Ordnance Department publication *History of Trench Warfare Material:*

Trench warfare has placed great importance upon the angle of arrival of projectiles...the grenade has provided the individual with a weapon whose angle of arrival is such as to make it effective in a trench under conditions which render the flat trajectory of the rifle bullet entirely ineffective.

When the United States entered WWI, there were no satisfactory modern hand grenades in our arsenal. The U.S. Army had experimented with various hand grenade designs for a number of years prior to WWI but had not settled on an acceptable grenade. As was the case with many other weapons, we turned to our allies for help. It was soon recognized that very large numbers of hand grenades would be needed by our troops. The initial requirements were for 21,000,000 "live" hand grenades and 2,000,000 inert practice/training grenades. However, as the war progressed, these initial estimates proved to be woefully short, and orders were eventually placed for some 68,000,000 live grenades and over 3,000,000 practice grenades. The U.S. Army procured five different types of hand grenades, many from its allies:

(1) Defensive grenade
(2) Offensive grenade
(3) Gas grenade
(4) Phosphorus grenade
(5) Incendiary grenade

The "defensive" or fragmentation hand grenade was, by far, the most widely used. The other types were designed for specific purposes rather than an "all purpose" grenade like the fragmentation variety.

The *Manual for Hand Bombers and Rifle Grenadiers* published by the War Department in July 1918 gives insight into the U.S. military's mindset regarding the use of grenades during the First World

Doughboys of the 2nd Battalion, 329th Infantry, 83rd Division undergoing hand grenade training at Le Mans, France, 1918. The caption reads as follows: *Soldiers were taught to lob the grenade up in the air so that it would land and stay on blankets which were laid on the ground.* (U.S. Army, courtesy Konrad F. Schreier, Jr.)

War. The following is a partial list of "General Principles" in the manual that was copied from a British Army manual:

The grenade is a weapon used by the infantry soldier as a supplement to his primary weapon, the rifle and bayonet.

The main functions of the grenade are to kill the enemy underground or behind cover, and to force him into the open where he will provide a target for the rifle and machine gun.

A bombing attack unaccompanied by an attack above ground is seldom of any value.

The grenade should not be regarded as a weapon with which to repel an attack unless such attack is made along a trench.

All officers and men who habitually fight on foot should be instructed in the construction and use of hand and rifle grenades and trained in the actual throwing of hand grenades.

The men selected as "hand bombers" should be those showing the greatest natural aptitude for the work and duties. Their natural aptitude is developed into expertness by training and practice. They should, in addition, be intelligent, physically fit for the hard manual labor involved, full of initiative and resource, and cool in emergencies.

Men employed as bombers must not be allowed to lose their efficiency in the use of the rifle and bayonet nor in the other duties of the infantry soldier.

As can be seen, the U.S. Army took the use of grenades very seriously, and much thought was given on how to best utilize the weapon. The first item on the agenda was obviously the development and production of suitable grenades.

Mark I "Defensive" Hand Grenade

After taking a look at all the available designs, the United States chose to adopt a version of the British "Mills bomb" grenade. The Mills bomb was of the familiar "pineapple" configuration and was about the size of a pear. By August 20, 1917, the Ordnance Department's Trench Warfare Section finalized the production drawings for the new American "defensive" (fragmentation) hand grenade designated as the "Mark I." A contract for 5,000 Mark I hand grenades was given to the Caskey-Dupree Company of Marietta, Ohio. The firm had worked closely with the Ordnance Department in developing the new grenade. However, this firm was unable to produce the large number of Mark I grenades that were needed, and a contract was given to the Gorham Manufacturing Company of Providence, Rhode Island, for production of complete grenades. Numerous other firms were granted contracts to produce grenade components that were to be assembled at various plants. By December of 1917, the various manufacturers had been given contracts for the production of 21,000,000 Mark I Mills bomb hand grenades. The Mark I design was very similar to the British grenades that had been successfully used in the war for several years. However, the Mark I

design incorporated several changes that were viewed as improvements over the original Mills grenade. The new American grenade had a malleable iron body that resulted in greater explosive force than the cast iron grenades used by our allies and adversaries. The new U.S. grenade included a lever which could be pivoted to the right or left by the thumb, thus allowing the firing mechanism to be engaged. This was intended to be a safer mechanism than found on the British "Mills bomb" grenade.

In addition to the live grenades, there were a number of inert practice and "dummy" Mark I grenades made as well. These were of the same configuration and weight as the live grenades but were painted red to allow them to be identified readily. The live Mark I grenades were painted "battleship" gray. The "dummy" training grenades were totally inert, while the "practice" grenades had a light black powder charge that resulted in a plume of smoke to simulate a burst, but they did not actually explode.

The new Mark I hand grenades were sent to France as fast as shipping allowed. However, the Ordnance Department had some questions about the Mark I design and sent the following cablegram to General Pershing on April 11, 1918, concurrent with the first shipment of grenades:

Top Row, left to right — Mark I "Defensive" (Fragmentation) hand grenade, Dummy Mark I grenade, Mark II "Defensive" (Fragmentation) hand grenade, Experimental "Schenkl" Fragmentation hand grenade (Impacted fused).
Bottom Row, left to right — Mark III "Offensive" hand grenade, Mark II Gas hand grenade, Mark I Thermit hand grenade, Dummy cast-iron "Mills bomb" grenade used for training. (Hayes Otoupalik collection)

Seventy-two thousand Mark I grenades being sent to you...some objection here to operation of the release lever. Claimed not as good as Mills. Please expedite test and report...

These concerns were well founded, and once the weapons got into the hands of our troops, the design flaws became apparent. The situation was so serious that the AEF sent a cablegram back to Washington ordering that no more Mark I grenades be sent over. As stated in the 1919 government publication *America's Munitions*:

The officers of the American Expeditionary Force in no uncertain terms condemned the American defensive (Mark I) grenade. The trouble was that in our anxiety to protect the American soldier we had designed a grenade that was too safe. The firing mechanism was too complicated. In the operation required to touch off the fuse five movements were necessary on the part of the soldier, and in this the psychology of a man in battle had not been taken sufficiently into consideration... Cases came to light showing that in the excitement of battle the American soldier forgot to release the safety device, thus giving the German an opportunity to hurl back the unexploded grenade.

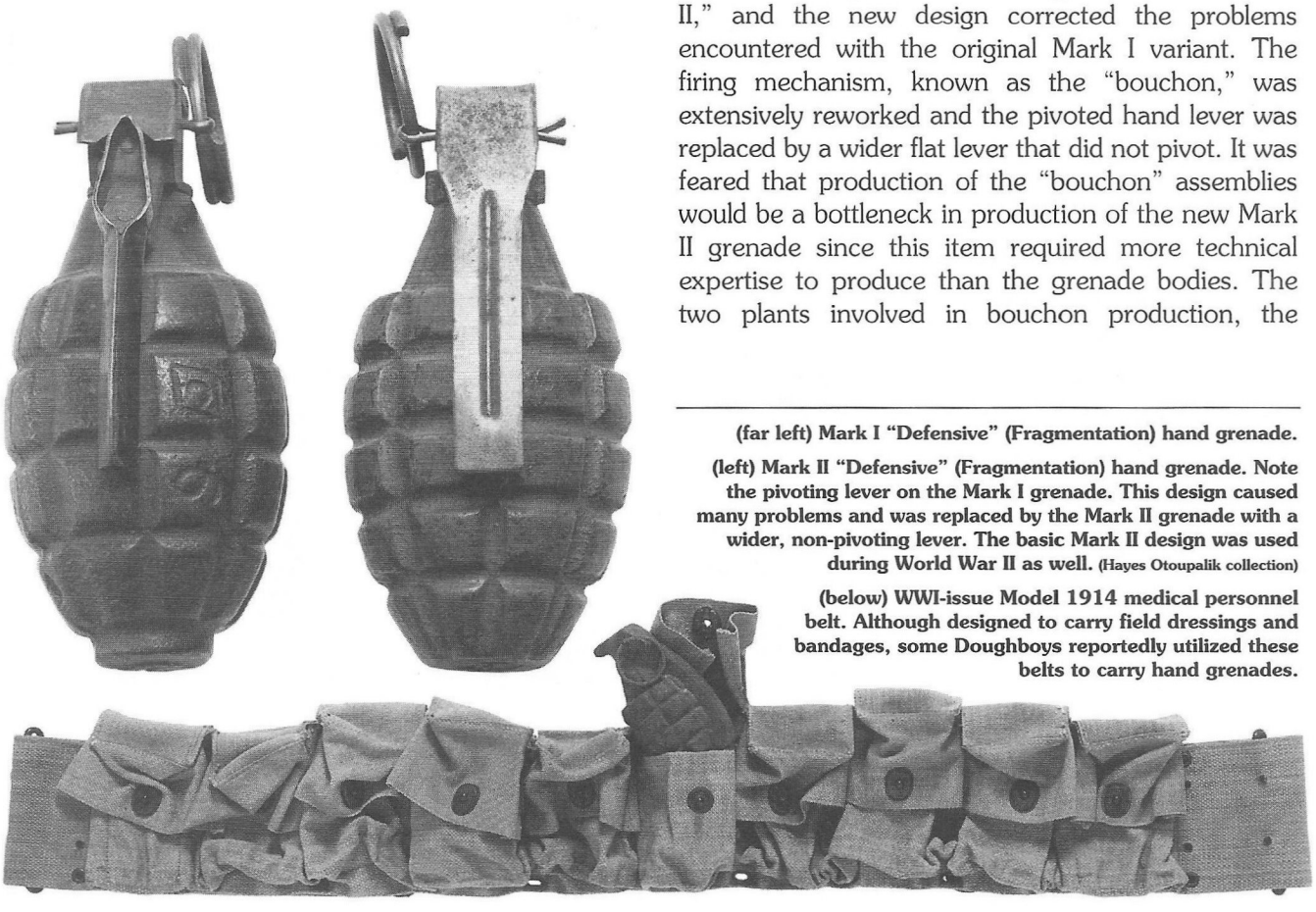
These problems had also been noted during preliminary hand grenade training in the United States as outlined in the 1918 War Department *Manual for Hand Bombers and Rifle Grenadiers*:

The lever mechanism of the American Hand Grenade (Mark I), was considered too safe and caused many malfunctions. In some cases where 40 student officers took part in throwing a live grenade from a trench (each student having 10 grenades to throw in quick succession) it was found that at least 30 percent of the grenades were not armed when they left the trench.

These deficiencies of the Mark I grenade resulted in the abrupt halt of its production and a complete redesign of the weapon's firing mechanism. There were about 1,000,000 completed grenades on hand in U.S. factories that had to be carefully disassembled to salvage the useable components. Another 3,500,000 empty grenades were also reworked. By July 1, 1918, the production of hand grenades in the United States had dropped to zero.

Mark II "Defensive" Hand Grenade

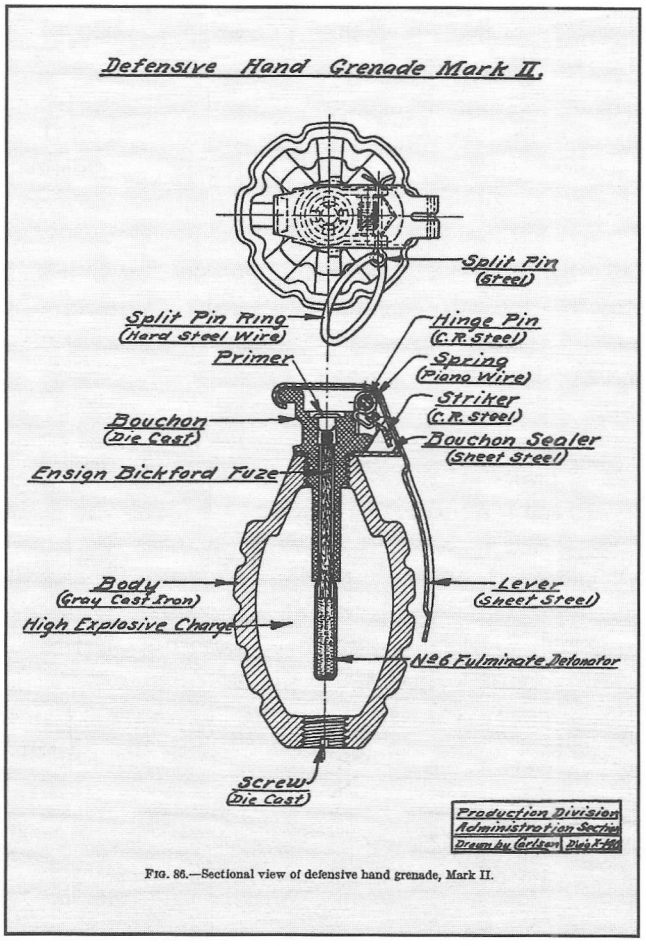
By August 1, 1918, a new defensive grenade had been designed, and approval was quickly forthcoming. The new grenade was designated as the "Mark II," and the new design corrected the problems encountered with the original Mark I variant. The firing mechanism, known as the "bouchon," was extensively reworked and the pivoted hand lever was replaced by a wider flat lever that did not pivot. It was feared that production of the "bouchon" assemblies would be a bottleneck in production of the new Mark II grenade since this item required more technical expertise to produce than the grenade bodies. The two plants involved in bouchon production, the



(far left) Mark I "Defensive" (Fragmentation) hand grenade.

(left) Mark II "Defensive" (Fragmentation) hand grenade. Note the pivoting lever on the Mark I grenade. This design caused many problems and was replaced by the Mark II grenade with a wider, non-pivoting lever. The basic Mark II design was used during World War II as well. (Hayes Otoupalik collection)

(below) WWI-issue Model 1914 medical personnel belt. Although designed to carry field dressings and bandages, some Doughboys reportedly utilized these belts to carry hand grenades.



Sectionalized view — Ordnance Department drawing of Mark II Defensive hand grenade. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

Precision Castings Company of Syracuse, New York, and the Doehler Die Castings Company of Toledo, Ohio, produced the devices in round-the-clock shifts. Eventually, some 64,600,000 bouchon assemblies were manufactured. These same bouchon assemblies were also used on most of the other types of hand grenades, thus the large number needed. There were six variants of the bouchon assemblies adopted before the end of production.

As was the case with the Mark I grenades, the companies involved in production of the Mark II grenade initially produced various components that were later assembled at a central plant. It was discovered that this procedure did not work well and, eventually, the Ordnance Department changed the process to allow individual firms to produce completed grenades in their own plants. However, for safety reasons, the loaded grenade bodies and live bouchon assemblies were shipped separately and assembled prior to reaching the front lines.

The following firms were involved in production of the Mark II hand grenade:

Caskey-Dupree Co., Marietta, OH
Spacke Machine & Tool Co., Indianapolis, IN
Stewart-Warner Speedometer Co., Chicago, IL
Miami Cycle & Manufacturing Co., Middletown, OH
American Radiator Co., Buffalo, NY
International Harvester Co., Chicago, IL
Doehler Die Castings Co., Brooklyn, NY
Precision Castings Co., Syracuse, NY

Contracts for the production of 44,000,000 Mark II defensive hand grenades were eventually granted. By the time of the Armistice, the daily production rate was between 250,000 and 300,000 grenades. By the time production contracts were cancelled on December 6, 1918, some 21,054,339 Mark II grenades had been completed. It is interesting to note that many of these were still on hand and used during World War II.

The U.S. Mark II defensive hand grenade had a malleable cast-iron body with deep grooves outside to produce proper fragmentation upon explosion. The grenade weighed 22 ounces and was loaded with 2 ounces of Trojan grenade explosive compound. The bouchon assembly had a five-second delay fuse. The body of the Mark II grenade, like its Mark I predecessor, was painted gray. There was also a dummy training version of the Mark II grenade having the same weight and configuration as the live version. The body was painted red.

The effective burst radius of the Mark II grenade was about 30 yards. However, like all hand grenades, the distance that they could be thrown was limited by the strength and skill of the thrower, and about 30 to 40 yards was the maximum that could be expected. As can be seen, the effective range of the grenade fragments could sometimes reach the thrower, so techniques were developed to seek cover after throwing. While on this subject it should be noted that the term "defensive" grenade is something of a misnomer, as the weapon was utilized for both defensive and offensive purposes. This is stated in an Ordnance publication on trench warfare materials:

...this type of grenade (defensive) is designed to be thrown only from a trench or other protected position, and not when the thrower is charging in attack. Naturally, it may be employed either in offense or defense, provided the thrower is in a position which affords protection from the fragments.

It is interesting to note that it was a widespread belief at the beginning of the war that American troops could make better use of hand grenades than the soldiers of other nations, since our boys literally grew up throwing baseballs. This quaint notion was soon

dispelled, as the technique of throwing a grenade was nothing like pitching a fastball or throwing out a runner at second base. As stated in the postwar report of General Hunter Liggett:

The American soldier expected to excel with the hand grenade by virtue of his baseball prowess, but we had to unlearn the baseball throw first of all. The grenade was not a baseball and the enemy trenches were not home plates.

For safety purposes, the Mark II hand grenades were packed separately from the bouchon assemblies with 24 to a wooden box. A wooden box containing 384 complete bouchon assemblies accompanied the grenade boxes. One box of bouchon assemblies was sufficient to complete 16 boxes of unfused grenades. When the bodies (loaded with explosives) were mated with the bouchons, the assembled grenades were placed back into the wooden boxes and sent forward to the front-line trench positions.

The Mark II proved to be an effective hand grenade and served our soldiers well. There were numerous examples cited in military reports regarding the use of hand grenades. Two interesting anecdotes of this type appeared in the 42nd Division unit history:

Before Yarnell was hit he was running up and down the trench with grenades piled in his left arm and one in his right hand, yelling, "Let those Dutch S.B.'s come on, I'll grenade the hell out of them."

Private Hugh H. Thorp...stationed near one of the communicating trenches leading to the abandoned trench system, threw six boxes of hand grenades into the German infantry. Nineteen dead Germans were counted afterwards in front of his post.

The Mark II remained the standard U.S. fragmentation hand grenade after WWI, and a slightly modified version of the weapon was widely used in World War II. Despite a rocky start, the United States eventually provided our Doughboys with a grenade that was at least the equal of any hand grenade of its type used during the war by either side.

"Schenkl" Experimental Fragmentation Hand Grenade

There was an experimental "Schenkl" fragmentation hand grenade tested but not adopted. The grenade was spherical in configuration and did not have a protruding safety lever as found on the standard hand grenades. Little is known about the Schenkl design and examples are very rare today. It is possible that this may have been a modernized version of a Civil War impact-fused grenade!

Mark III "Offensive" Hand Grenade

The "Offensive" hand grenade was intended for use in close-quarter combat, thus the fragmentation effect of the "defensive" grenade was not desired. The offensive grenade was intended to disable or disorient the enemy by violent concussive effect at close range without being a source of danger to the user due to flying fragments. Two preliminary designs, the "Mark I" and "Mark II," were tested but were not satisfactory. In early 1918, an improved variant, the "Mark III" was developed and eventually adopted. In order to eliminate the dangerous metal fragments, the Mark III grenade was made with a body constructed of laminated paper with a lightweight cast-metal top into which the bouchon assembly was screwed. The body was dipped in paraffin to provide waterproofing.

Initial estimates were that some 7,000,000 Mark III offensive hand grenades would be needed. As was the case with the defensive grenades, this estimate proved to be woefully inadequate. In the first quarter of 1918, a contract was given to the firm of Single Service Package Corporation for production of the grenade

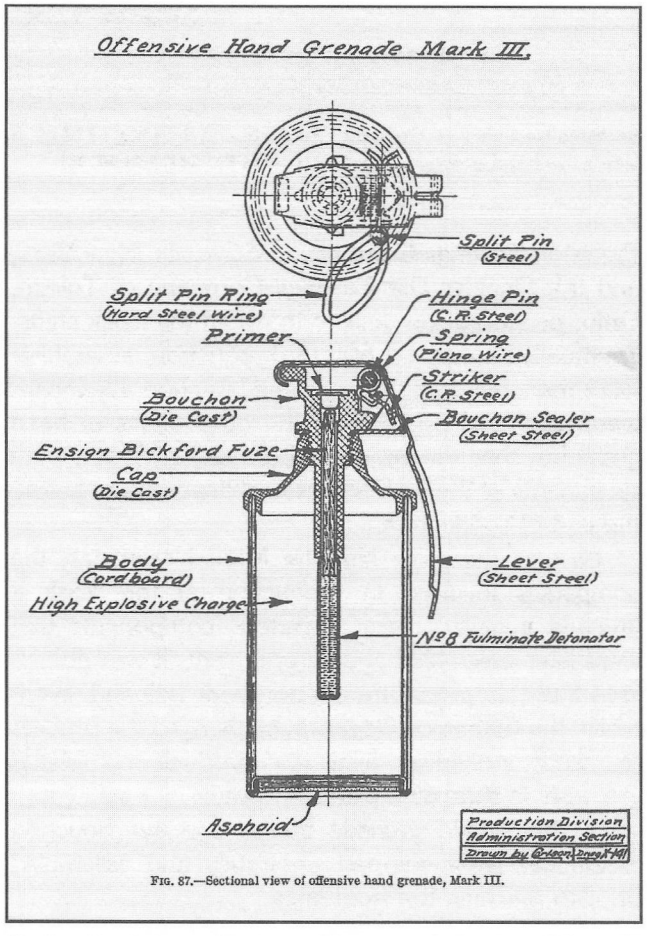


FIG. 87.—Sectional view of offensive hand grenade, Mark III.

Sectionalized view — Ordnance Department drawing of Mark III Offensive hand grenade. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

bodies. The metal tops were produced by the Doehler Die Casting Company. The Single Service Packaging Corporation was the sole firm that assembled the Mark III hand grenades. By the time of the Armistice, this firm had reached a daily production rate of 55,000 to 60,000 Mark III offensive hand grenades. Some 6,179,321 complete Mark III bodies had been delivered by the time the production contract was cancelled on December 6, 1918. The remaining 17,599,000 Mark III offensive hand grenades originally ordered were never manufactured.

The Mark III offensive hand grenade weighed 12 ounces and was filled with 4 ounces of Trojan grenade explosive compound. The Mark III grenade had the same type of five-second delay fuse as used with the Mark II fragmentation grenade. The Mark III bodies were initially painted black, but this was soon changed to gray.

The offensive grenades were useful in specific instances in combat but did not have the all-around utility (and lethality) of the Mark II fragmentation grenade. Even though grenades of this type remained in use through the Second World War, they very much took a back seat to the Mark II fragmentation ("defensive") hand grenade.

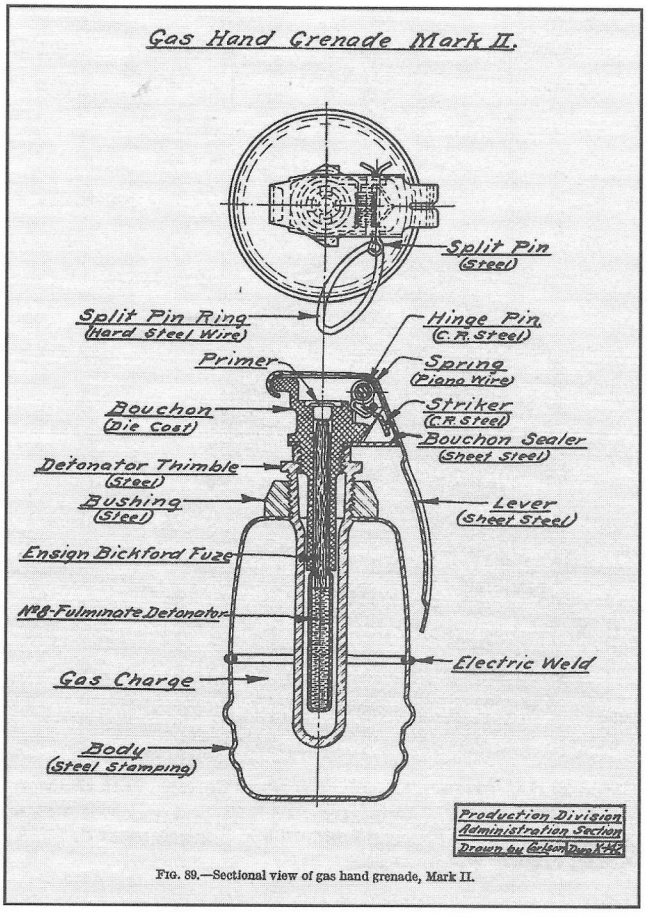


FIG. 89.—Sectional view of gas hand grenade, Mark II.

Sectionalized view — Ordnance Department drawing of Mark II Gas hand grenade. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

Gas Grenades

The "Gas Hand Grenade, Mark II," was designed to dispense toxic or irritating gas. The original design specifications were finalized by the Ordnance Department in January of 1918, and a contract for 1,000,000 of the grenades was granted to the Maxim Silencer Company of Hartford, Connecticut. According to Ordnance Department documents, production of the Mark II gas grenade "...offered some peculiar difficulties..." Obviously, it was important to have the poisonous (12½ ounce of stannic tetrachloride) or irritating ("CN") contents of the grenade securely sealed to prevent leaking. Specially designed "detonator thimbles" were required, and it was feared that production of these items might delay assembly of the grenades. However, the two firms involved, The Maxim Company and the Bassie Company of Bridgeport, Connecticut, produced a total of 1,982,731 detonator thimbles by December 6, 1918, so production was never seriously delayed.

The Mark II gas grenade was constructed of two drawn sheet metal halves welded together to form a gas-tight container. The specifications called for the grenade to withstand a minimum of 200 pounds of pressure (psi). Government records indicate that as many as 50 percent of the grenade bodies failed during inspection (prior to filling with the chemical compound). It was determined that 200 psi was greatly in excess of requirements, and the specifications were lowered to 50 psi. This lowering of the pressure resulted in manufacturing rejects being reduced to virtually zero. The completed bodies were delivered to "filling plants" where the chemical compounds were inserted and the grenade sealed. The grenades were shipped in cases holding 24 each.

The Mark II gas grenade weighed 22 ounces (including the 12½ ounces of toxic stannic tetrachloride or irritating "CN" gas) and was fitted with the same type of bouchon assembly as the offensive hand grenade with a five-second delay fuse. Samples of the Mark II gas grenade were sent to the AEF and the "Infantry Specialist" school for preliminary testing prior to full-scale issue. The only requested change was to lengthen the lever. The body of the Mark II gas grenade was painted gray.

In order to increase production, additional contracts for Mark II gas grenade bodies were given to the Evinrude Company of Milwaukee, Wisconsin, for 500,000, the John W. Brown Manufacturing Company of Columbus, Ohio, for 500,000 and the Zenite

Corporal H.C. Maston, Chemical Warfare Service, 78th Division, with several chemical hand grenades including an experimental gas grenade held in his right hand. Photo taken October 8, 1918, Meuse, France. (National Archives)

Metal Co. of Indianapolis, Indiana, for 400,000. The firms involved in production reached a daily rate of about 22,000 by the time of the Armistice. Some 936,395 had been completed by the time production ceased on December 6, 1918.

Although the Mark II gas grenade was being made in quantity, the war ended before extremely large numbers could be shipped overseas. The use of toxic gas grenades required special precautions. As stated in the Ordnance Department publication *History of Trench Warfare Material*:

Lethal gas grenades are used but they are rather dangerous to friendly personnel, because of the fumes coming out among the bombers which may cause casualties, and in any event necessitates the wearing of gas masks by the bombers all the time.

The gas grenades filled with irritating gas were known as "Lachrymatory" grenades. As stated, these were filled with an irritating compound such as "CN" gas ("tear gas"). The Lachrymatory gas grenades had essentially the same purpose as the poison gas grenades but were not as dangerous to the user as the lethal variety.

Unlike the Mark II fragmentation grenade, the gas grenade was essentially a single-purpose weapon. As stated in an Ordnance Department document:

This grenade (the Mark II gas grenade) was designed for use in cleaning out dugouts, but is of very little use for other purposes on account of the short range which can be obtained.

The relatively small amount of gas (lethal or "CN") that was generated by the grenade was only effective in confined spaces (such as trench dugouts, etc.) and dissipated rapidly in open air. These weapons were only marginally successful due to limited application and the danger involved in shipping, storing and issuing the grenades.

The Mark II gas grenade was not retained in large numbers following the war. The poison gas variety was never again used in combat and was uniquely a weapon associated with the First World War. However, improved versions of the tear gas chemical grenades remained items of issue well into World War II.

Mark II Phosphorus Hand Grenade

According to government records, the white phosphorus hand grenade was designed primarily to "...create clouds of smoke for screen." However, the white phosphorus (WP) hand grenade had other applications as stated in a postwar Ordnance Department document:

The material (phosphorus) was unsurpassed as a smoke producer and it also paid dividends in other ways. Burning phosphorus wounded enemy soldiers just as readily as rifle bullets and shell fragments. Fragments of burning phosphorus streaking through the air were also hard on enemy morale.

The final specifications and production drawings for the Mark II phosphorus hand grenade were completed in January of 1918 and the following contracts were granted in February to the following firms: Metropolitan Engineering Co., Brooklyn, NY — 750,000; Evinrude Motor Co., Milwaukee, WI — 750,000; Zenite Metal Co., Indianapolis, IN — 500,000.

Two of these firms were also employed in production of the gas grenades, which were similar in construction to the phosphorus grenade. The above-named companies made only the grenade bodies, with the chemical compound to be added later. Production of the phosphorus hand grenade conflicted with production of other war material, including the gas grenade, and delivery schedules were seriously delayed. There were also production delays encountered due to shortages of white phosphorus in the United States.

The Mark II white phosphorus hand grenade weighed 20 ounces including 4 ounces of filler. The body was constructed of sheet metal in much the same manner as the Mark II gas grenade. It also utilized the

Soldiers of the 80th Division. The soldier at left, Sgt. G.L. Bramer of Company A, is inserting a phosphorus rod rifle grenade into his M1917 rifle. Private J.G. Derry (Company B) at right is arming a chemical hand grenade by striking the fuse mechanism on his heel. Photo taken at Meuse, France, October 27, 1918. (U.S. Army Military History Institute)

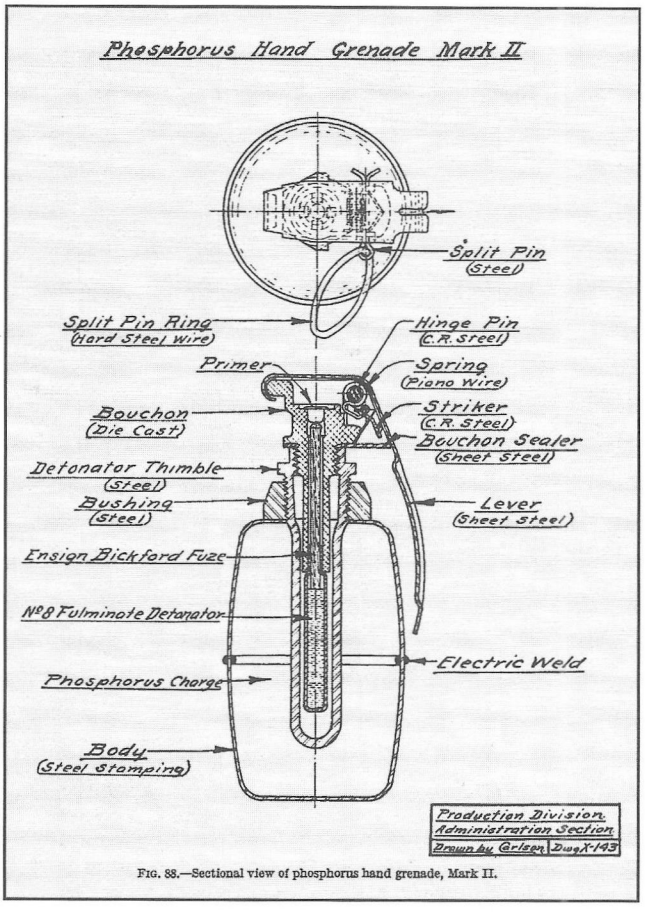


FIG. 88.—Sectional view of phosphorus hand grenade, Mark II.

(left) Sectionalized view — Ordnance Department drawing of Mark II Phosphorus hand grenade.
(U.S. Army, courtesy Konrad F. Schreier, Jr.)

(below) Personnel from the "Gas Headquarters Co.," 1st Corps, U.S. Army, firing White Phosphorous (WP) rod rifle grenades, France, October 6, 1918. (National Archives)

same type of bouchon assembly as the gas grenade with a five-second delay. The body of the grenade was painted gray. The Mark II phosphorus hand grenades were shipped in cases containing 24 grenades.

Even with the production delays, some of the Mark II phosphorous hand grenades were used in combat by the Doughboys. However, the overall performance of the weapon was less than impressive. As stated in an Ordnance Department report on the subject:

After carefully investigating the use of the phosphorus grenade, the American Expeditionary Forces found that its chief use was in taking machine-gun emplacements. The phosphorus hand grenade was of very little use for this work on account of the short range which was obtained...

Despite these rather negative feelings, the white phosphorus hand grenade remained in limited use after WWI, and fairly large numbers of similar weapons were fielded during the Second World War.

"Thermit" and "Incendiary" Hand Grenade

Officially known as the "Thermit Hand Grenade, Mark I," this weapon was copied from a French design. Thermit is an incendiary mixture of powdered aluminum and powdered iron oxide which burns at a very high temperature when ignited. Prior to American grenades of this type going into production, the United States obtained a number of Thermit grenades from our French allies. The U.S. initially designated the grenade as the "Mark I Incendiary," but this nomenclature had to be changed to "Mark I Thermit" due to the pending development of another type of incendiary hand grenade. This other type of grenade differed from the Thermit grenade primarily in the addition of oil to an explosive/burning compound used as filler. It was redesignated as the "Mark I Incendiary" hand grenade to distinguish it from the Thermit grenade.

The French often utilized their Thermit hand grenades to destroy captured enemy artillery pieces by permanently fusing the breech blocks closed. The U.S. Mark I Thermit hand grenade was intended for the same sort of use. The American Mark I Incendiary hand grenade was envisioned for such tasks as setting fire to enemy ammunition dumps.

It was not until October of 1918 that the first contract for Mark I Thermit grenades was given to the Doehler Die Castings Company for 655,450. The U.S. Mark I Thermit hand grenade weighed 30 ounces and was constructed of a tin body. Rather than the bouchon assembly used with the other American hand grenades, the Mark I Thermit grenade used the same type of fuse as the French pattern. This five-second fuse was ignited by removing a protective cover and

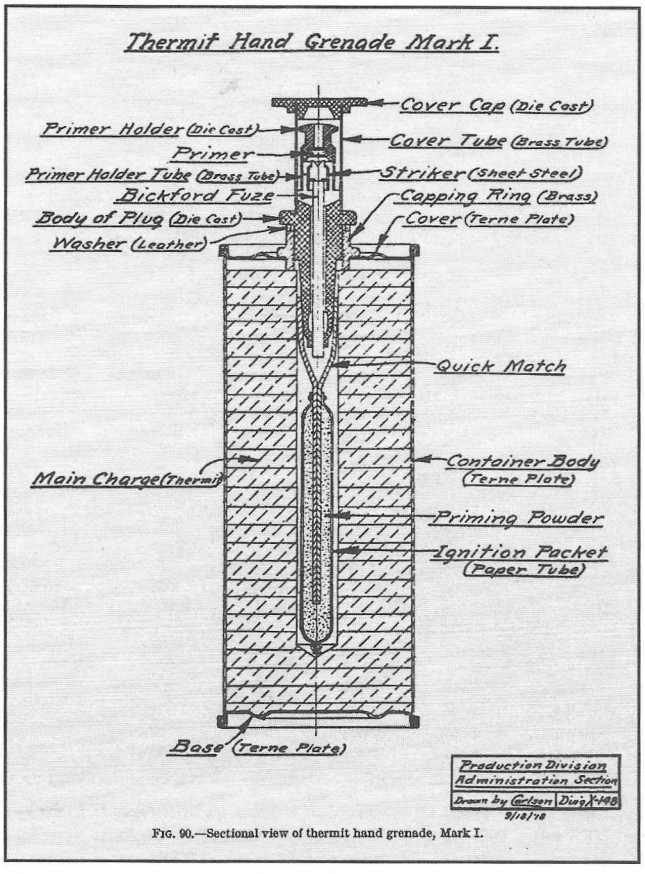


FIG. 90.—Sectional view of thermit hand grenade, Mark I.

Sectionalized view — Ordnance Department drawing of Mark I Thermit hand grenade. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

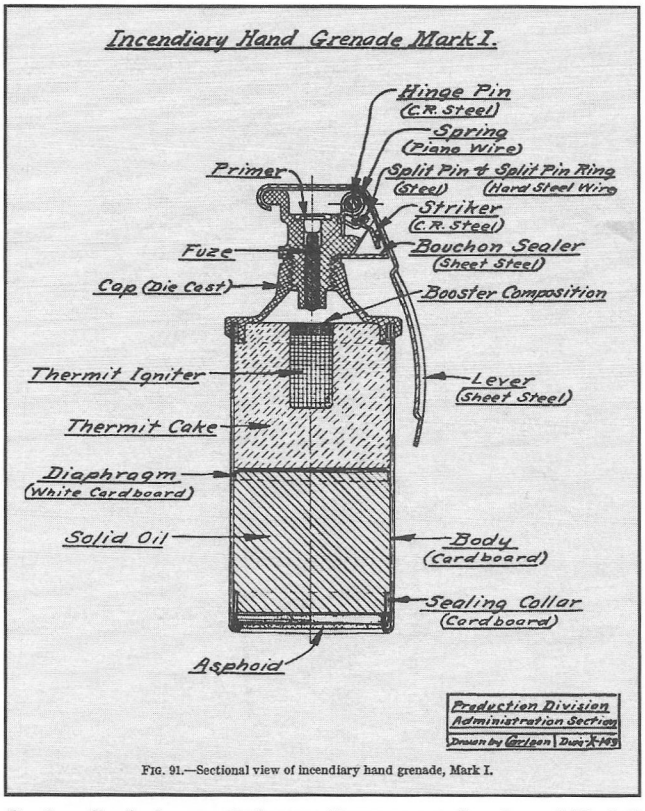


FIG. 91.—Sectional view of incendiary hand grenade, Mark I.

Sectionalized view — Ordnance Department drawing of Mark I Incendiary hand grenade. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

striking the top on a hard surface. The grenade was normally placed by hand rather than thrown. The war ended before the American-made grenades made it overseas, thus the French-made Thermit grenades were used exclusively by our Doughboys.

While the French Thermit grenades were used in fair numbers by U.S. troops, the Mark I Incendiary hand grenade was generally viewed as a less useful weapon. It was stated in *America's Munitions*:

The Incendiary grenade (Mark I) not only did not get out of the development state, but even a perfected model was regarded as of doubtful value by the officers of the American Expeditionary Forces. Nevertheless, the Chemical Warfare Service was of the opinion that such a grenade should be worked out, and an order for 81,000 had been given to the Celluloid Co. of Newark, NJ. Experimental work was progressing satisfactorily when the armistice was signed.

It is reported that an experimental quantity of Mark I Incendiary hand grenades was sent to France for testing prior to the end of the war.

The experimental Mark I Incendiary hand grenade weighed 24 ounces and was constructed with a paper body in much the same manner as the offensive hand grenade. As stated, none were used during the war except on an experimental test basis. Thus, only the Thermit hand grenade was an item of issue to the Doughboys for combat purposes.

The following table of hand grenade production was published by the War Department in *America's Munitions* in 1919:

Article	***Completed to Nov. 8, 1918***	***Completed to Feb. 1, 1919***	***Sent Overseas***
Dummy hand grenade	*415,870*	*415,870*	------
Practice hand grenade	*3,605,864*	*3,605,864*	------
Defensive hand grenade	*17,477,245*	*25,312,795*	*516,533*
Offensive hand grenade	*5,359,321*	*7,000,000*	*173,136*
Gas hand grenade	*635,551*	*1,501,176*	*249,239*
Phosphorus hand grenade	*505,192*	*521,948*	*150,600*

Rifle Grenades and Grenade Launchers

While the hand grenade was a useful weapon, its main drawback was the lack of range. There was a clear need for a high curved-trajectory weapon that could engage enemy targets between the range of a hand-thrown grenade and the trench mortar (to be discussed next). This niche was filled by the rifle grenade.

Although developed prior to the First World War, rifle grenades were seldom employed before 1914. The unique aspects of trench combat resulted in a surprising amount of emphasis placed on the use of rifle grenades. While often overlooked today, rifle grenades were an important infantry weapon of World War I. A grenade that could be launched from a rifle into an enemy trench or machine gun position at much greater distances than could be thrown by hand was obviously a valuable weapon.

There were a number of experimental devices considered to increase the range of grenades including "combination" grenades that could be thrown by hand or launched from a rifle. One of the more unusual experiments tried by the United States was the development of a "grenade javelin." This weapon consisted of a 5½-foot shaft with a grenade attached to each end. The theory was that the javelin could be thrown much farther than could a hand grenade by itself. Upon impact, the explosion of one grenade would supposedly result in the other grenade being detonated. This weapon is mentioned in the Ordnance Department publication *The History of Trench Warfare,* but no photographs or other information have been discovered. In any event, the "grenade javelin" and other "creative," if not bizarre, ideas were recognized as being impractical, and further development was dropped. Other types of grenade "throwers" or "projectors" were tested including the "Abbott Grenade Thrower," which was a five-pound wooden projectile loaded with 180 shrapnel balls, the "Conrad Grenade Thrower," which was a discharger attached to a four-foot tube and the "Farrell Grenade Thrower" which utilized discarded M1903 rifle actions. Although all were tested, none were adopted or produced in any but experimental quantities.

Babbit Rifle Grenade

Prior to the First World War, the United States Army had experimented with several types of rifle

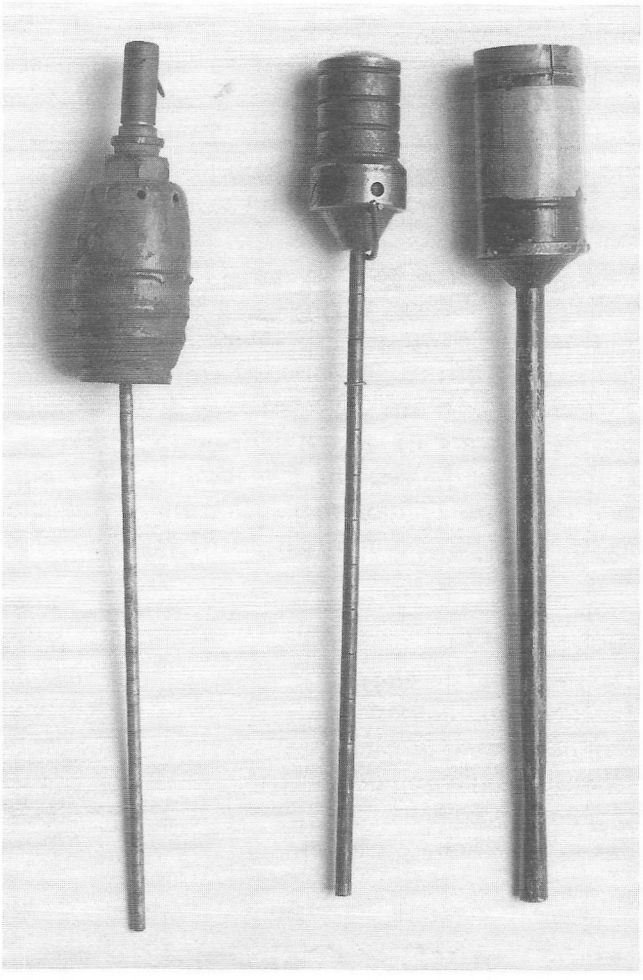
grenades. The "Babbit" rifle grenade was adopted in 1911 and issued in limited numbers by the United States before the nation's active involvement in the war. The Babbit was a rod-type rifle grenade which had a long stem attached to the bottom of its body. The stem was inserted into the M1903's bore, and the grenade was fired with a special blank-type cartridge. A portion of the gas generated by firing was channeled down the tube to arm the fuse, and the remaining gas propelled the grenade. The following is a description of the weapon as contained in Chapter XIX of the 1918 *Manual for Hand Bombers and Rifle Grenadiers*:

..the American Babbit Rifle Grenade (is) fitted with a stem, which is inserted into the muzzle of the rifle. The grenade is shot forward by the pressure of the gasses formed by firing a special blank cartridge, with which the rifle is loaded. The range is regulated by the distance the stem is inserted into the muzzle of the rifle, the maximum range being about 350 yards.

It has been reported that stems from Babbit rifle grenades were sometimes hurled as far as 300 yards from the point of explosion. While rifle grenadiers were normally beyond the "danger zone" (the distance that fragments can be lethal), this could not always be assured, so caution was in order.

The primary advantage of the Babbit grenade was that it did not require any sort of separate launcher. There were, however, several definite drawbacks to the design. First, the metal stem that was inserted into the bore could easily damage the rifling as it wobbled back and forth while leaving the barrel. Second, the long stem protruding from the grenade made it awkward for the infantryman to carry. Third, the weapon required the use of a special blank cartridge.

The U.S. Babbit rifle grenade was issued with a protective metal carrying case. Some inert dummy Babbit rifle grenades were also produced for training purposes. While some of the U.S. Babbit rifle grenades saw use during the war, particularly in the early stages, a better design was clearly needed.



U.S. "Rod" rifle grenades: Left, Mark II Chemical rifle grenade. These grenades were modified from gas hand grenades by the addition of the launching stem and an impact detonating fuse. Center, U.S. Babbit Rod rifle grenade. Right, protective metal carrying case for Babbit rifle grenade. (Hayes Otoupalik collection)

Chemical Rifle Grenades, "Mark I" and "Mark II"

In addition to the Babbit fragmentation grenade, the U.S. Army utilized two types of chemical rifle rod grenades. These were the "Mark I" chemical rifle grenade with either white phosphorus (WP) or smoke ("FM") and the "Mark II" "Lachrymatory" gas grenade filled with "CN" (tear gas) compound. Both types of chemical rifle grenades were modified from gas hand grenades by the addition of the launching stem and the change from a time to a point impact detonating fuse. The "Mark I" chemical rifle grenade had a single raised ridge on the center of the body, and the "Mark II" had three raised ridges on the body.

These chemical rod rifle grenades did not see widespread use until the latter part of the war and remained in inventory into the 1930s. As was the case with the Babbit fragmentation rifle grenade, the gas rod rifle grenades required the use of a blank cartridge. Some later production blank cartridges of this type were head stamped "CRG" for "Chemical Rifle Grenade."

The chemical rifle rod grenades shared the same drawbacks as the Babbit rod grenade, including the cumbersome length and the potential for damage to the rifle bore. For these reasons, use of the rod grenades was limited, but another type of rifle grenade was destined to see extensive use by our troops during the war.

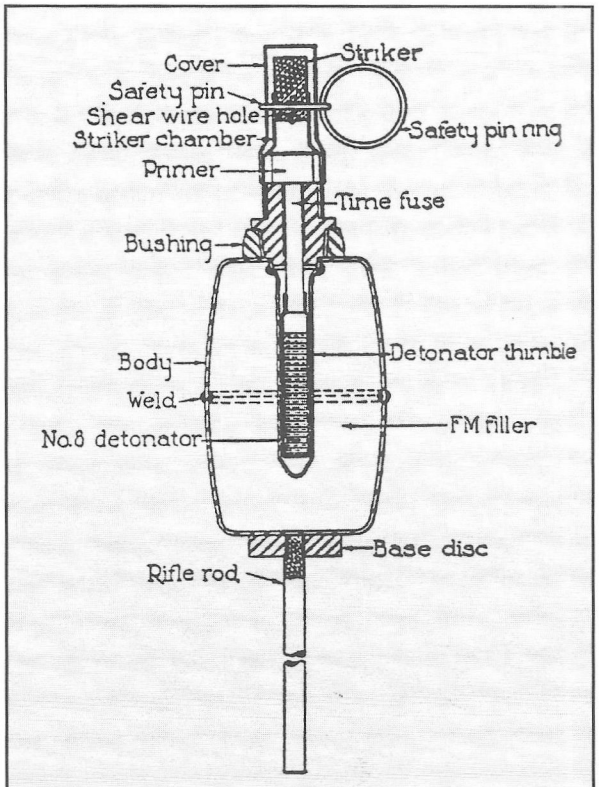


FIGURE 10.—Smoke rifle grenade, Mk. I

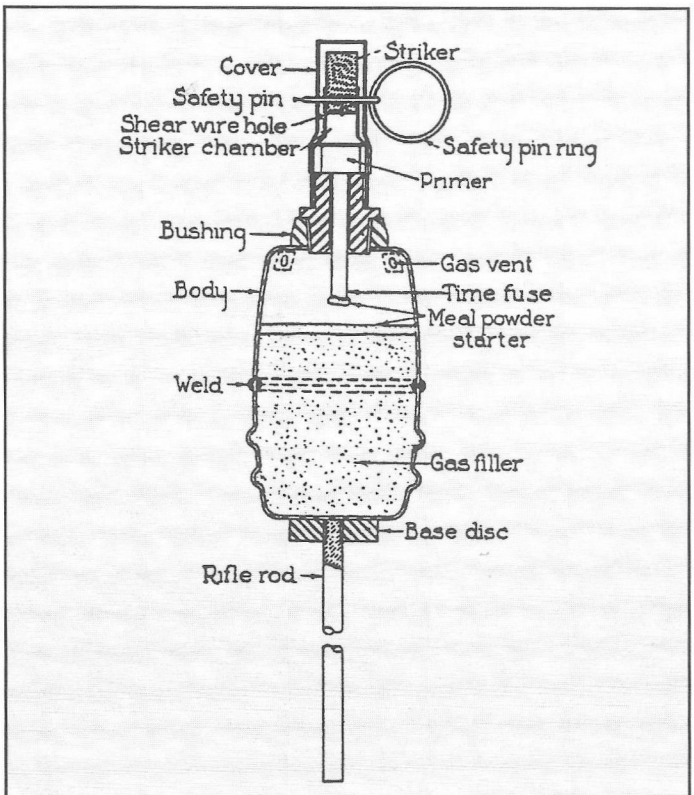
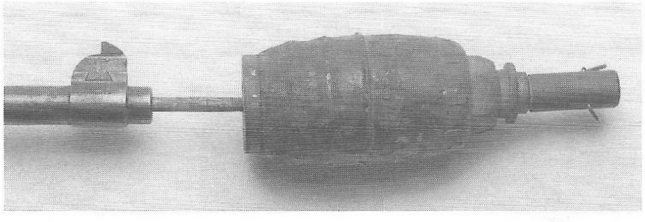


FIGURE 11.—Lachrymatory rifle grenade, CN, Mk. II

(above, left) Ordnance Department drawing of Mark I smoke rod rifle grenade. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

(above, right) Ordnance Department drawing of Mark II "Lachrymatory" ("CN" gas) rod rifle grenade. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

(right) Mark II chemical rifle grenade partially inserted into bore of M1903 rifle. The range was regulated by how far the stem was inserted into the barrel. (Hayes Otoupalik collection)



(below) World War I vintage War Department drawing depicting the procedure for firing rifle rod grenades. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

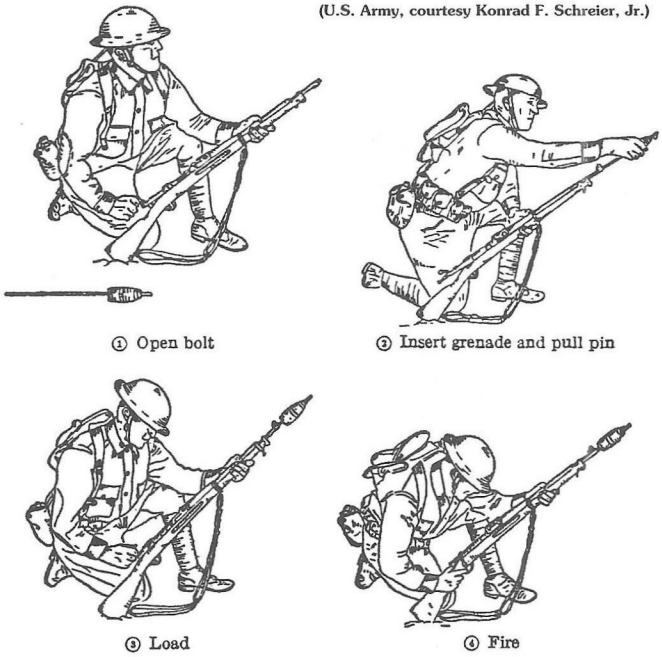
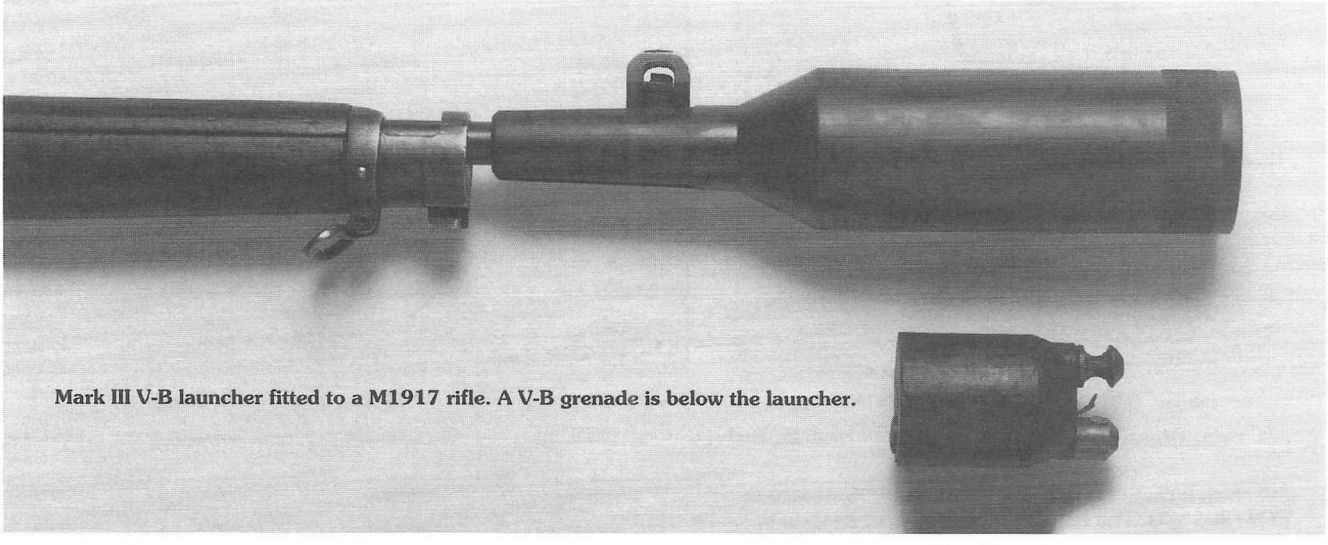


FIGURE 12.—Firing from the kneeling position

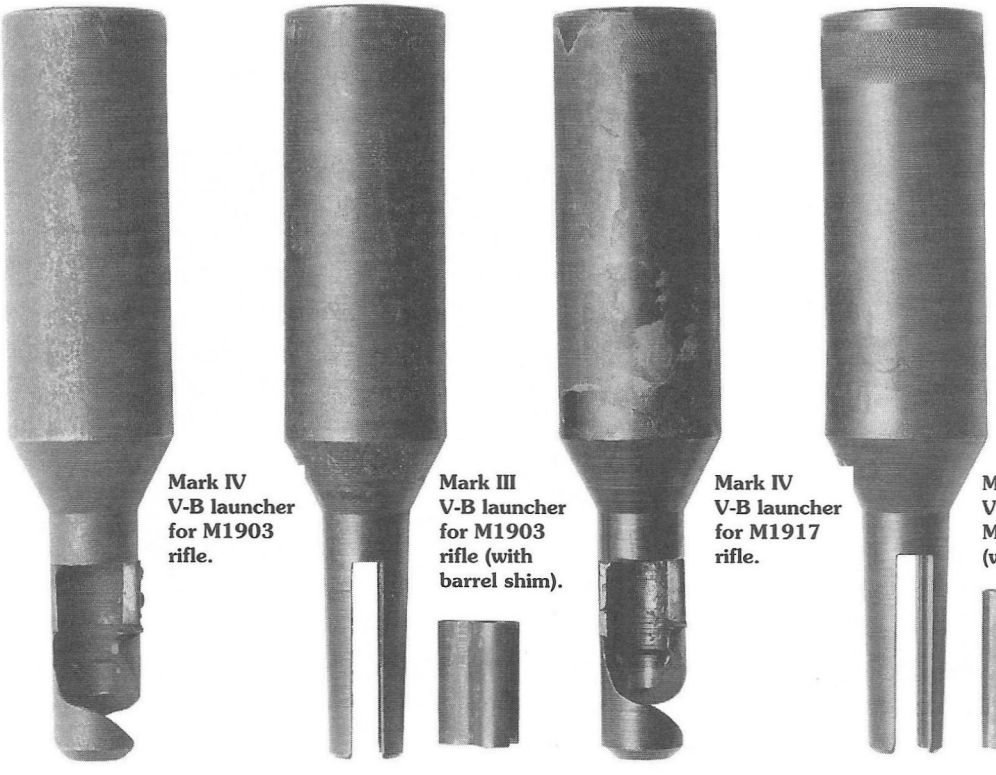
Chemical Warfare Service Officer Captain E.C. Popp, demonstrating the procedure for firing a gas rod rifle grenade, October 26, 1918. (U.S. Army Military History Institute)

Viven-Bessiere (V-B) Rifle Grenade and Launchers

Our French allies had previously adopted a rifle grenade launcher developed by two Frenchmen, Jean Viven and Gustave Bessiere. Known by the developers' initials, "V-B," the discharger (called a "tromblon") was a heavy metal "cup" that fitted over the muzzle of the rifle. A cylindrical grenade with a hole through the middle was inserted into the discharger (tromblon). The launcher used a standard rifle cartridge. The bullet passed through the hole in the grenade and armed the time fuse. The cartridge gasses propelled the grenade up to a maximum range of 200 yards. Up to two V-B grenades could be loaded in the launcher and fired at one time. Even though a separate launcher was required, the V-B was used with standard ammunition and did not harm the bore of the rifle as did rod rifle grenades such as the Babbit. On the negative side, the V-B launcher generated a great deal of recoil which sometimes resulted in broken rifle stocks. This was reportedly the primary reason for adding the second recoil lug ("stock screw") to the M1903 rifle stock circa late 1917. The normal firing procedure was to place the butt of the rifle on the ground and adjust the



Mark III V-B launcher fitted to a M1917 rifle. A V-B grenade is below the launcher.



Mark IV V-B launcher for M1903 rifle.

Mark III V-B launcher for M1903 rifle (with barrel shim).

Mark IV V-B launcher for M1917 rifle.

Mark III V-B launcher for M1917 rifle (with barrel shim).

U.S. V-B Rifle grenade launchers.
(Hayes Otoupalik collection and author's collection)

Note the "spiral slot" vs. the "straight slot" of the Mark IV and Mark III variants and the respective size of the barrel shims for the M1903 and M1917 rifles.

range by raising or lowering the muzzle. The French Army developed special launching racks into which one or more rifles equipped with V-B launchers could be placed. The racks contained a range-adjustment mechanism that allowed the grenades to be fired somewhat more accurately than could be achieved by an individual soldier with a single rifle.

Early in 1917, it was decided to adopt the French V-B launcher and grenade for use with our standard M1903 and M1917 rifles. The V-B was standardized by the Chief of Ordnance on July 16, 1917. While adoption and production of American-made V-B launchers was in process, a number of Lebel or Berthier rifles fitted with French V-B launchers were issued to American infantry units. Despite the fact that this introduced non-standard weapons into American infantry units, the consensus was that this practice was better than having no rifle grenade launchers at all. It didn't take long for enterprising Doughboys to modify some of the French launchers to fit our service rifles. While good in theory, this practice caused some problems. This situation was mentioned in a report from the 42nd Division:

Doughboy preparing to fire a rifle grenade from a M1903 rifle equipped with a V-B launcher. (National Archives)

Doughboys of the 36th Division practicing with V-B launchers attached to M1917 rifles. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

WWI photo of French soldier demonstrating the use of a V-B rifle grenade and launcher attached to a Berthier rifle. Some American Army units were issued French rifles and V-B launchers prior to the U.S. versions going into production. (National Archives)

Rifle-grenades were not a part of the American army's equipment when we went into action. To overcome this deficiency they at first issued a French rifle and French grenades to one man in each infantry squad. The device called a tromblon was fitted to the muzzle of the rifle and the butt of the rifle was placed firmly against the ground...

Someone at the ordnance base re-designed the base of the French tromblon so that it would fit the muzzle of the Springfield rifle, but they failed to take into consideration the great difference in pressure developed by the propelling charge of the American cartridge. It seems that the Rainbow was the first to receive this new brainchild and they were promptly issued to all the infantry squads in the division. The next day many of the men were in the hospital and their rifles were beyond repair.

V-B Launchers

In order to minimize the time between adoption and production, the French V-B launcher was essentially copied "as is." The only substantive modification was the relatively minor dimensional changes required to fit the American rifle. Otherwise, the American V-B launchers were very similar to the French models. It is reported in Ordnance Department documents that some 50,000 V-B launchers for American service rifles were made in France prior to the U.S.-made launchers going into production.

There were several variants of V-B launchers used by the United States during the First World War. These were:

The original French V-B Launchers that were modified to fit the M1903 or M1917 rifles. This was the launcher that caused serious problems alluded to previously when used with the U.S. rifles.

"Mark I" V-B Launcher made for use with the M1903 and M1917 rifles. While not spelled out in ordnance documents, it appears that the 50,000 V-B launchers produced in France for the United States government were of the "Mark I" variant.

"Mark II" V-B Launcher. This variant was not manufactured or issued.

"Mark III" V-B Launcher for M1903 and M1917 rifles. The designation of the rifle was stamped on the outside of the body (i.e., "For Use Only on Rifle Model of 1903", etc.). The Mark III launchers made for the M1917 rifles had a knurled band, while the launchers made for the '03 rifle had smooth bodies. The Mark III launchers are characterized by a straight slot into which the barrel was inserted. In order to provide a secure fit between barrel and launcher, it was necessary to use a sheet metal shim. The shim snapped onto the rifle barrel between the front band and front sight. The shims for the M1903 and M1917 rifles were different in length and were marked with the identity of the respective rifles.

"Mark IV" V-B Launcher for M1903 and M1917 rifles. These launchers are characterized by a "spiral" slot, which allowed a more secure fit without the necessity of having to use a separate barrel shim. The Mark IV launchers were also stamped with the rifle designation on the body. As was the case with the Mark III launchers, the variant used with the M1903 rifle had a smooth body, and the type used with the M1917 had a knurled band. The Mark IV V-B launcher superseded the Mark III variant, although both types saw use during the war.

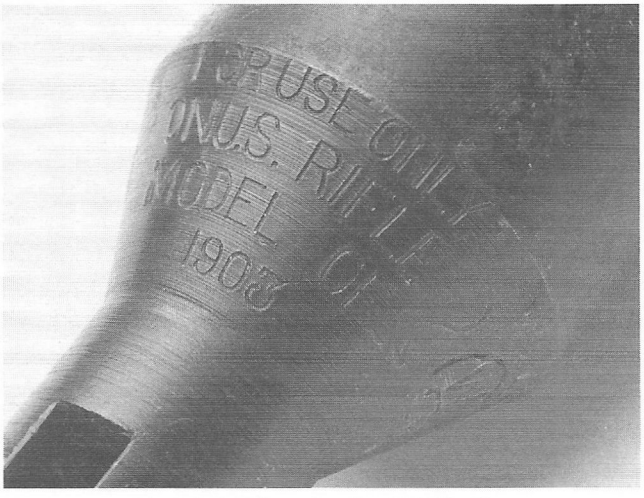
Early prototype U.S. V-B launchers had the rifle designations hand-stamped. At least one unmarked example has also been noted. Very early pre-production launchers were blued, but the production models were finished in a very dark phosphate or parkerized finish. Most examples were made by the Westinghouse Corporation and were marked with an underlined, circled "W". The U.S. V-B grenade launcher weighed 3 pounds, 3 ounces.

V-B Grenades

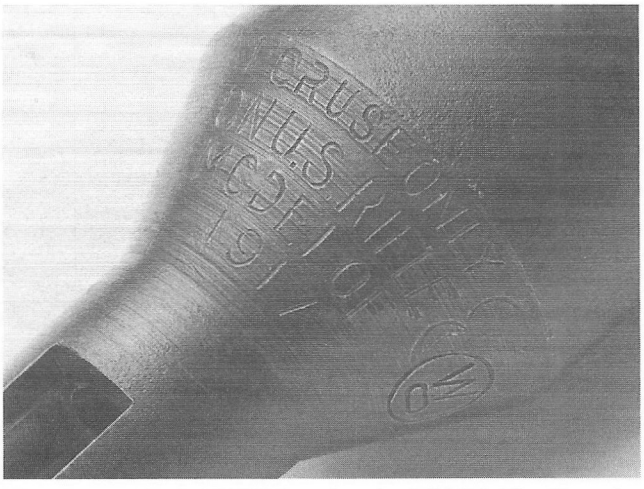
Like the launchers, the V-B grenade adopted by the United States was similar to the French-made variety. The grenade was designated as the "V-B Rifle Grenade, Mark I." Other than some slight changes in the dimension and configuration, the main difference was that the Mark I American V-B grenade was made of malleable rather than cast iron. The Mark I V-B grenade was about 2½" long and 2" in diameter and weighed approximately 17¼ ounces. The maximum range was about 200 yards when fired at a 45-degree angle. The "danger zone" of the V-B was approximately 75 yards. The V-B grenade was termed both an "offensive" and "defensive" weapon since the firer was generally out of range of exploding fragments.

In order to prevent gas from bypassing the body of the grenade, the V-B grenades were internally serrated to provide for the proper fragmentation effect while leaving a smooth surface on the outside of the body. Like the hand grenades, the V-B grenades were painted gray. Some dummy and practice V-B grenades were also made. These were painted red to distinguish them from the live grenades and to make it easier to retrieve them for reuse. The dummy V-B grenade had an "hourglass" configuration while the practice grenades were externally identical to the live grenades. The Westinghouse Electric and Manufacturing Co. was given an initial contract to produce

U.S. troops training with M1917 rifles and Mark IV V-B grenade launchers during World War I. Note the Doughboy at right preparing to drop a V-B grenade into the launcher. (National Archives)



Markings on Mark III V-B launcher for M1903 rifle.
(Hayes Otoupalik collection)



Markings on Mark III V-B launcher for M1917 rifle. Note the circled "W" marking indicating production by Westinghouse.
(Author's collection)

U.S. troops of the 32nd Division with French weapons. The soldier at right is firing a M1915 Chauchat automatic rifle and the Doughboy at left is preparing to fire a rifle grenade from a French V-B launcher attached to a Berthier rifle.
(U.S. Army, courtesy Konrad F. Schreier, Jr.)

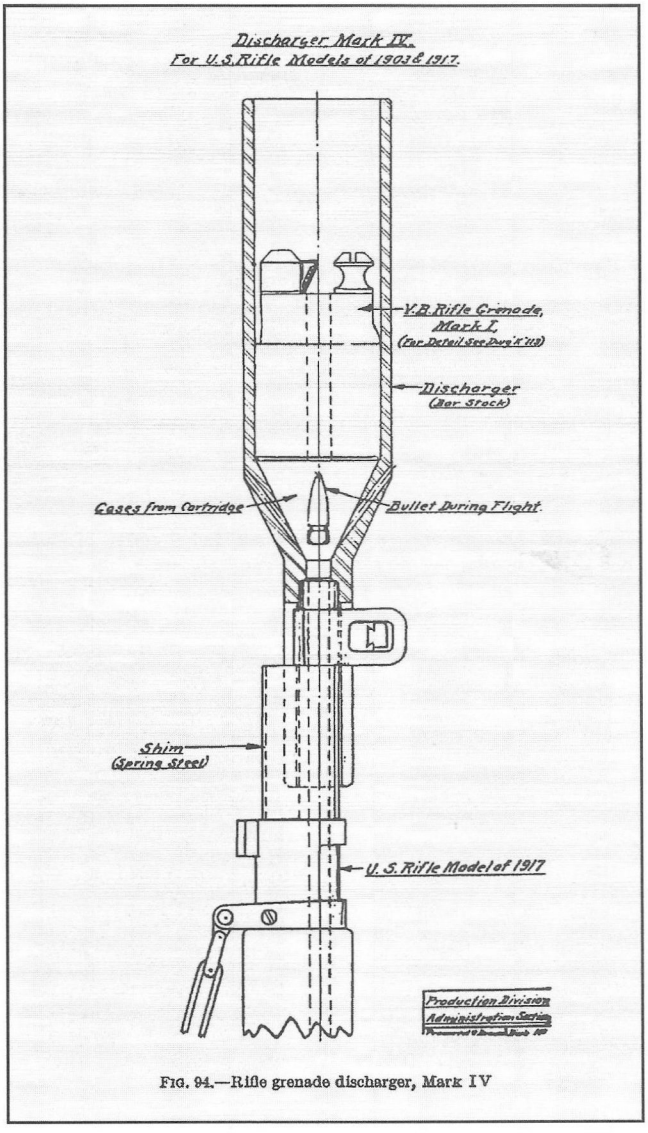


FIG. 94.—Rifle grenade discharger, Mark IV

Ordnance Department sectionalized drawing of V-B launcher and grenade mounted on M1917 rifle. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

5,000,000 Mark I V-B rifle grenades, and subsequent contacts were given to other manufacturers.

As the American-made V-B launchers and grenades began to see use, some problems were reported. The problems with the launcher were due primarily to the higher pressure of the U.S. rifle cartridge, which resulted in drastically increased recoil and firing stresses. In order to reduce this excessive pressure, it was proposed that vent holes be drilled in the base of the launcher. This issue was addressed in an Ordnance Department report on the subject:

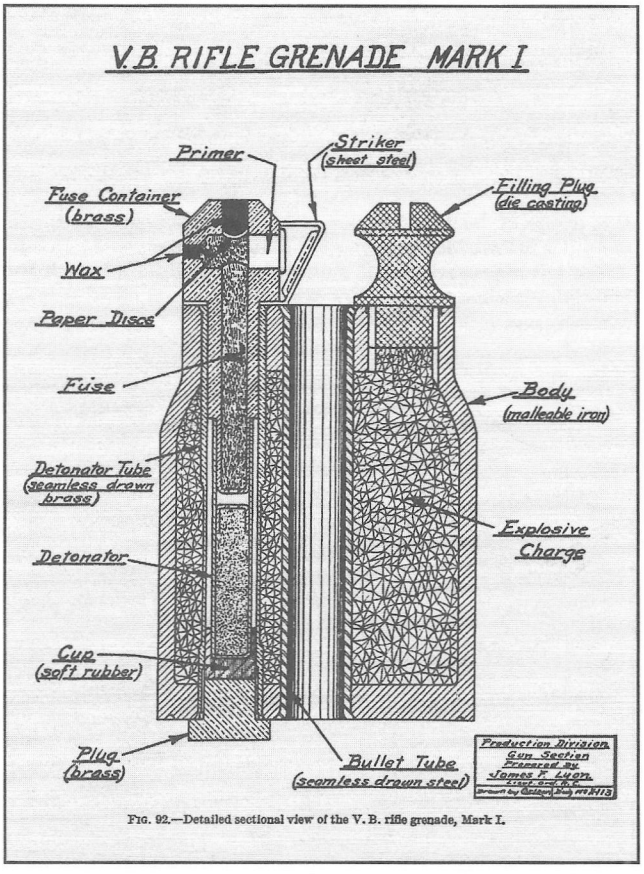
This office (Chief of Ordnance, AEF) sent a cablegram to the United States advising that all grenade dischargers manufactured and those in production should be drilled with two ventholes in the base of the discharger.

However, this seemingly simple expedient measure created other problems, as it significantly reduced the effective range of the V-B grenade due to a lessening of the gas pressure. The above report went on to comment that:

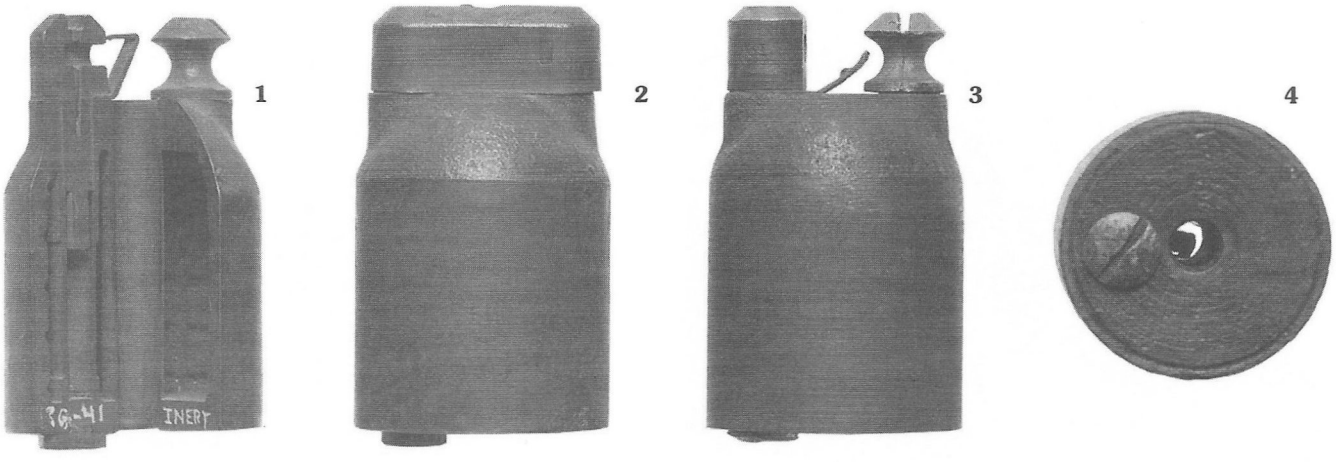
The average range of (the V-B) grenade was (reduced to) approximately 148 yards. This range did not meet the requirements for the tactical use of this type grenade.

It appears that far fewer than half of the V-B launchers were modified by drilling the gas escape holes. It was felt by many Doughboys that the increased recoil was an acceptable trade-off in order to achieve the desired range.

In addition to these problems with the launcher, there were some deficiencies found with the Mark I V-B grenade itself. There were some defects found with the grenade's fuse but these were not terribly significant. A thin brass cover was issued that helped protect the fuse mechanism of the grenade. The most troubling aspect of the American V-B grenade was due to copying the French design without making the necessary allowances for the differences between the U.S. and French rifle ammunition. This lack of foresight caused much delay and consternation in American



Ordnance Department detailed sectionalized drawing of Mark I V-B rifle grenade. (U.S. Army, courtesy Konrad F. Schreier, Jr.)



U.S. V-B rifle grenades (left to right) — (1) Sectionalized view of U.S. V-B rifle grenade; (2) V-B grenade with protective brass cover in place over the fuse mechanism; (3) Standard V-B rifle grenade; (4) Bottom view of standard V-B rifle grenade showing the hole through which the bullet passed. (Hayes Otoupalik collection and author's collection)

military circles. The situation was aptly summed up by the Assistant Secretary of War in his book, *America's Munitions*:

...in the anxiety of producing this weapon (the V-B) in the shortest time possible the models were not sufficiently tested, and no consideration was taken of the differences in design between a French bullet and an American bullet. The result was that the French (pattern) grenade did not function well with our ammunition, due to the splitting of the Springfield bullet as it passes through the grenade. The result was that in May, 1918 several months after manufacture of this grenade had been in progress, the entire undertaking was canceled pending the development of new designs; and the 3,500,000 completed grenades had to be salvaged.

The Mark I V-B grenade was redesigned to make it suitable for use with the U.S. M1906 cartridge, and the previous problems were substantially eliminated. Contracts for 30,115,409 improved V-B rifle grenades were placed with several firms. The companies involved in V-B grenade production were:

Westinghouse Electric & Manufacturing Co., Pittsburgh, PA
Briggs & Stratton Co., Milwaukee, WI
Holcomb & Hoke, Indianapolis, IN
Stewart-Warner Speedometer Corporation, Chicago, IL
Cutler-Hammer Manufacturing Co., Milwaukee, WI
American Radiator Co., Buffalo, NY
Link Belt Co., Indianapolis, IN
Doehler Die Castings Co., Brooklyn, NY

By August of 1918, daily production of V-B rifle grenades had reached 130,000 and by the end of October had increased to 250,000. It was foreseen that very large numbers of rifle grenades would be needed for the upcoming "Grand Offensive" planned for the spring of 1919. There were 20,000,000 V-B rifle grenades ready for loading in the United States at the time of the Armistice although only some 685,200 had been shipped overseas before the cessation of hostilities.

In addition to the fragmentation and training versions, there were several other variants of the V-B grenade considered for use. By the end of the war, phosphorous and incendiary V-B grenades were being tested, but few were actually used in combat. Among the more interesting experimental V-B grenades was the "message grenade." The French had previously adopted grenades of this type, and large numbers were reportedly manufactured. This grenade was approximately the same size as the standard V-B rifle grenade and featured a "message carrying tube" at the top into which written dispatches could be inserted and then projected to adjacent friendly units. When the grenade impacted against the ground, a plume of smoke was emitted to aid in locating the message. The V-B "message grenade" was fired by means of a special blank-type cartridge rather than the standard rifle cartridge. One hundred grenades of this pattern were procured by the U.S. Army and tested at the First Corps School in France. The official results of this test revealed that the V-B message grenade was unsuited for use due to the following reasons:

(1) The maximum range of 200 yards was considered insufficient

(2) The smoke tracer was not sufficient to locate the grenade

(3) If the grenade landed on soft ground, it buried itself

Doughboy firing a V-B grenade from a M1903 rifle. Soldier identified as Private John Dafnomiles, Company F, 2nd Battalion, 6th Regiment, 5th Infantry Division. Photo taken September 24, 1918, Moselle, France. Note the M1905 bayonet attached to his pack and the pockets of the grenade bandoleer below the scabbard.
(U.S. Army Military History Institute)

(4) If it landed on rocks, the body was broken and the message tube lost

Due to these shortcomings, the V-B message grenade was not approved for adoption by the Trench Warfare Section of the AEF. Such a device, nevertheless, illustrated potential innovative uses for rifle grenades.

There were also several types of pyrotechnic devices launched via the V-B launcher including flares for signaling and illuminating purposes. These were ready for large-scale issue by the end of the war but few were actually used.

The V-B launchers were initially issued with leather carrying cases. However, these proved to be prone to deterioration, and canvas cases were substituted. Most, if not all, of these were made after the war by Rock Island Arsenal, and it is not known if any of the canvas carrying cases were produced in time to see service during WWI.

A cloth bandoleer with eleven pockets and attachment straps was manufactured to carry V-B grenades. These bandoleers could also be used to carry hand grenades but were more commonly employed by rifle grenadiers. Large numbers were made and some remained on hand during WWII when they were sometimes utilized by Marines to carry shotgun shells and other types of ammunition.

It has been reported that some M1914 medical personnel belts having nine large pockets to carry field dressings and other first aid supplies were sometimes appropriated by Doughboys during the war and used to carry hand grenades and rifle grenades. The pockets on the belts were large enough to hold a single grenade. Utilization of such belts to carry grenades is yet another example of "field expediency" practiced by fighting men in all wars.

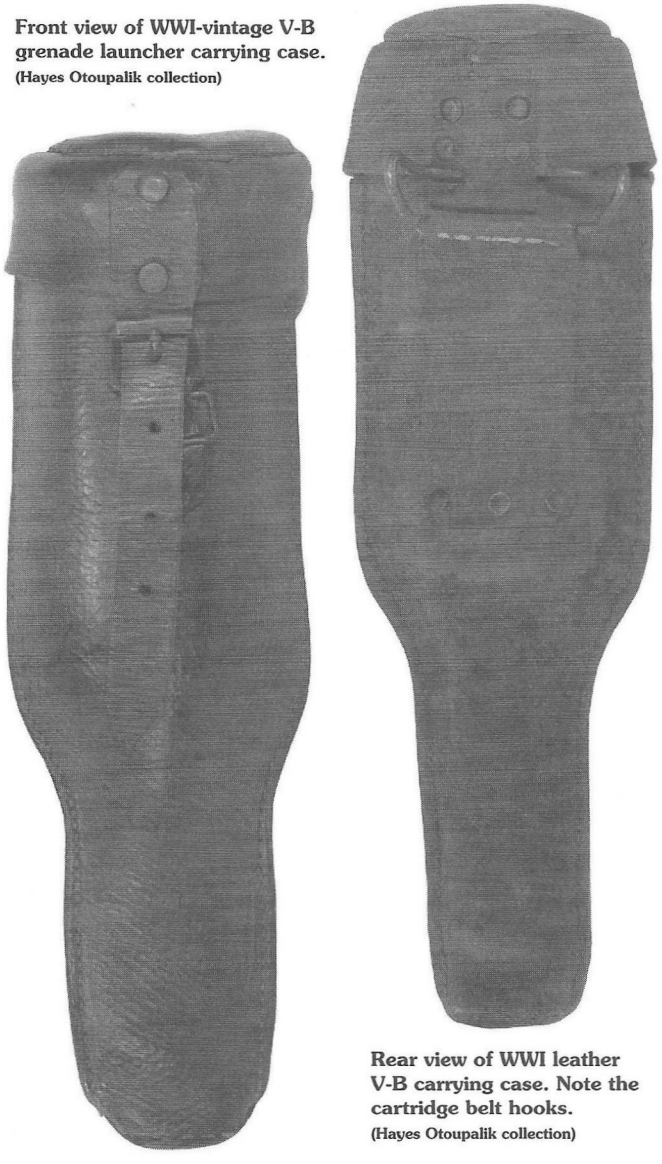
Despite the above-enumerated problems, V-B grenades were used to good effect by the Doughboys. There were numerous instances cited regarding both the deficiencies and triumphs of the weapon. The utilization of rifle grenades could be dangerous to the user if not preceded by proper training. A good example of this is related in the book *Fighting Soldier — The AEF in 1918* by Joseph Douglas Lawrence:

A man named Gilbert, a few yards from me, had a rifle grenade that he clumsily was trying to fire. I do not know where he got it; there was not one in the platoon when we started down the road after the supposed machine-gun nest; finally he got it into the cup on the muzzle of his rifle and to my horror and before I could stop him he fired it straight up; I drew up in a knot waiting for it to fall on us; and it fell a few yards behind us with a loud crash; fortunately without damage.

The manufacturing defects mentioned previously also resulted in some tragic accidents, particularly in training. One such episode was revealed in the book *Over There*:

...a rifle grenade hung fire and exploded in the horn, killing instantly the first-lieutenant instructor and wounding a student. Only yesterday afternoon, that same instructor gave me my first lesson in the use of the rifle-grenade... It has cast quite a gloom over the whole school, but I suppose we ought to expect some accidents occasionally — for there is much work going on on the range all the time.

Negative instances like this were balanced by many cases in which the V-B grenades provided valuable service to our troops. The grenades were often used against German machine gun emplacements. A dispatch from the 89th Division stated:



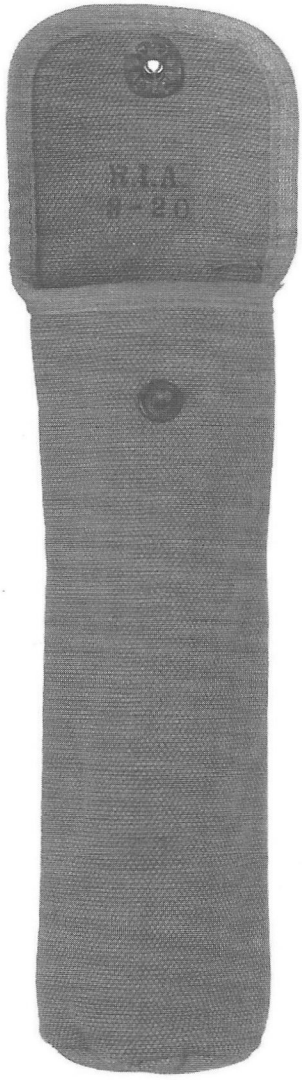
Front view of WWI-vintage V-B grenade launcher carrying case. (Hayes Otoupalik collection)

Rear view of WWI leather V-B carrying case. Note the cartridge belt hooks. (Hayes Otoupalik collection)

Every infantry soldier was required to carry two rifle grenades in addition to his other equipment. The 177th Brigade, leading the attack, used this weapon effectively against machine gun nests in the Bois de Barricourt and just beyond...

The rifle grenade proved to be one of the most effective weapons for the work of reducing machine gun nests, when operated by determined and courageous grenadiers. For example, a rifle grenadier, Private First Class Cecil E. Reed, of Company "E," 353rd Infantry, advanced out of the forest into the open ground to obtain a range for his grenades, though the place was under withering machine gun fire and his comrades were seeking what cover they could find. Kneeling in the open he fired his entire supply of ammunition, then dashed back and obtained more from the other men. He returned to his firing position and when all his grenades were again fired, returned the second time to get more. This time he moved forward to a still more advanced position, from which he succeeded in placing shots so close to the enemy machine gunners that he drove them from their shelters and they were killed by other men of the company.

There were many similar instances in which Doughboys used their V-B grenades with telling effect against the Germans. It is interesting to note that some stateside Army recruiters would reportedly display a V-B launcher and tell impressionable potential recruits that the war could be comfortably fought from the safety of the trenches while lobbing rifle grenades into the distant German trenches. It is not known how many young men of the day were gullible enough to buy that story!



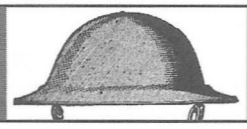
Postwar canvas V-B carrying case.

WWI rifle grenade bandoleer with 11 pockets for carrying grenades.

While not a perfect design, the V-B was arguably the best rifle grenade of WWI. The official "TO&E" requirements for a U.S. Army Infantry Division was 1,560 rifle grenade launchers.

Following the war, the V-B launcher remained an item of standard issue for the United States. However, curiously, after 1918 it was viewed as more of a pyrotechnic discharger than a grenade launcher. Large numbers of the V-B launchers were declared as surplus and sold as scrap metal from the 1930s and 1940s. It is reported that some remained in use into early WWII by the U.S. Marine Corps. Surviving examples are rather rare today. The V-B rifle grenade was an integral part of the Doughboy's arsenal and provided valuable service within its limits. It is a classic, yet often overlooked, U.S. infantry weapon of World War I.

Collector Notes



Compared to many of the other weapons we have discussed, there is not a great deal of collector interest in the various U.S. grenades of the war. Collecting live grenades, particularly 80+ year old grenades, is not a wise idea, as their explosive components have deteriorated and may be unstable. Any live grenade is considered a "Destructive Device" that must be registered under the provisions of the National Firearms Act (See Table #56, pg. 278).

Hand Grenades

Even though there are virtually no live collector specimens of WWI hand grenades, some were rendered inert and are safe to own with no legal restrictions. Also, the dummy and inert practice grenades can be possessed with no danger or legal "red tape." However, most of the U.S. WWI hand grenades are uncommon today and any inert specimen would be a nice addition to a collection. While on the subject, it should be mentioned that there have been a number of instances over the past twenty years or so that a supposedly inert WWI-vintage grenade in a collection was actually a live grenade. All grenades that have not obviously been rendered inert should be approached warily. Any live grenade, even 80+ years old, is extremely dangerous.

Examples of the ill-fated Mark I "defensive" grenades are especially hard to find. Dummy grenades of this pattern show up occasionally, but the standard pattern (rendered inert) can be considered rare. Inert Mark II grenades show up a bit more often but are becoming harder to find. A number of inert WWI hand grenades were made into souvenirs such as cigar lighters, table lamps, etc. The Mark II grenades of First World War and Second World War vintage look very much alike, but there are some rather subtle external differences. The pivoted release lever of the Mark I grenade makes it easy to identify this variant.

The other types of hand grenades such as the cardboard-bodied "Offensive" grenades are also extremely hard to find today as few survived due to the rather fragile nature of the cardboard body. Any inert example should be obtained whenever possible. The various types of inert gas hand grenades are equally scarce.

Rifle Grenades and Grenade Launchers

The same caveats regarding the possession of live hand grenades apply to rifle grenades as well. Inert or dummy U.S. Babbit and chemical rod-type rifle grenades are quite uncommon. However, inert U.S. V-B rifle grenades are still around in fair number today, although prices can sometimes be a bit high. Many are missing all or part of the fuse mechanism (inert) which devalues an example to some extent.

U.S. V-B launchers are quite hard to find today and are usually very expensive. Except for the prototype examples, the production specimens are marked with an underlined and circled "W" to denote manufacture by Westinghouse. The launchers are stamped on the outside of the body "M1903" or "M1917" to distinguish which rifle for which they were intended. The modified French launchers and French-made "Mark I" are very rarely seen on the market today. The production Mark III and Mark IV V-B launchers seem to bring about the same, given comparable condition.

The shims used with some of the launchers are also marked on the outside with the nomenclature of the rifle. Original V-B shims are very hard to find, although some reproductions were made in the early 1980s.

The early leather V-B carrying cases are extremely rare. The later canvas variety is fairly common. Most are made of heavy canvas material (with cartridge belt hooks) and are marked "RIA" and dated "1920" inside the cover flap. Interestingly, some V-B carrying cases made of lighter-weight canvas material dated "1942" inside the cover may be found today. Most examples are in new condition. It is reported that these cases were made for Marine Corps use in early WWII.

The cloth rifle grenade bandoleers are still very common on today's market and can usually be purchased for a modest price. Most examples are in unissued condition and are marked on the back with the name of the maker, year of production ("1918" is the most common) and inspector initials.

Any inert example of a U.S. hand grenade or rifle grenade would be a fine addition to a WWI collection. A V-B launcher would also be quite interesting for display with a M1903 or M1917 rifle in a collection.

The scarcity of WWI grenades and rifle grenade launchers will ensure their continued value to collectors interested in such artifacts. They are extremely interesting and worthy collectibles.

Trench Mortars

Although mortars had been in use for centuries, they were typically extremely large and heavy siege-type weapons that were not easily transportable. Mortars were curved-trajectory weapons that could lob shells into trenches whose occupants would be unaffected by flat trajectory weapons but, compared to standard artillery, mortars had a relatively short range. The Germans had large numbers of "Minenwerfers" (mortars) ranging from 77mm to 150mm on hand at the beginning of the war, but such weapons are best classified as "trench artillery" since they were not mobile enough to accompany troops. The French and British also utilized some heavy mortars, but these were also relatively immobile and were in the category of artillery rather than infantry weapons.

It quickly became clear that some type of weapon was needed to provide artillery-like fire support to the infantry. While rifle grenades were useful for small-scale work, they possessed insufficient range and power to serve such purposes. A weapon that was fully man-transportable yet could fire reasonably powerful shells at targets beyond the range of rifle grenades was badly needed. The Stokes trench mortar was developed for precisely this purpose.

The Stokes trench mortar was developed by an Englishman, Sir Wilfred Scott Stokes (1860–1927) who was the managing director of a mechanical engineering firm, Ransome & Rapier of Ipswich, England. Although Stokes did not have a military background, he quickly grasped the need for a "portable gun" soon after war erupted in Europe. Stokes correctly reasoned that such a weapon would be valuable for reducing the deadly machine gun nests that were beginning to wreak much havoc on the Western Front. Stokes had a working prototype of his trench mortar ready for testing in December of 1914, barely four months after the war started.

Like many notable inventions, Stokes' mortar was ingenious in its simplicity. Stokes' mechanical engineering background enabled him to design a weapon and ammunition that was easy to manufacture and use. The weapon consisted of a smooth bore tube (barrel) 3 inches in diameter with a metal end cap that fitted into a flat base plate. The 51-inch barrel was supported by a bipod that could be adjusted for range. The weapon was broken down into three sections for easy transport — the barrel (tube) which weighed 43 pounds, the base plate (28 pounds) and bipod (37 pounds) for a total of 108 pounds.

The mortar fired a high-explosive shell weighing about 11 pounds. The maximum range was approximately 800 yards. Due to exploding fragments, the

Illustration of Mark I 3" Stokes mortar. This example is fitted with the oval base plate as used by the British. U.S.-made mortars were normally equipped with square base plates.
(U.S. Army, courtesy Konrad F. Schreier, Jr.)

Photograph of Sir Wilfred Stokes, inventor of the Stokes trench mortar, carrying a prototype of his 3" mortar. This view shows the extreme portability of the weapon as compared to standard artillery pieces. (Konrad F. Schreier, Jr.)

Drawing of "Clinometer" used for indirect firing of Stokes mortar. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

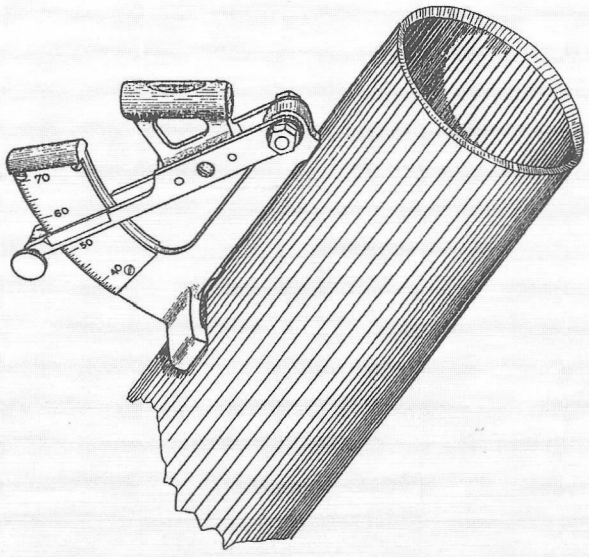


Plate 8. Clinometer, Mk. I, for 3-inch Trench Mortar, Mk. I (Stokes).

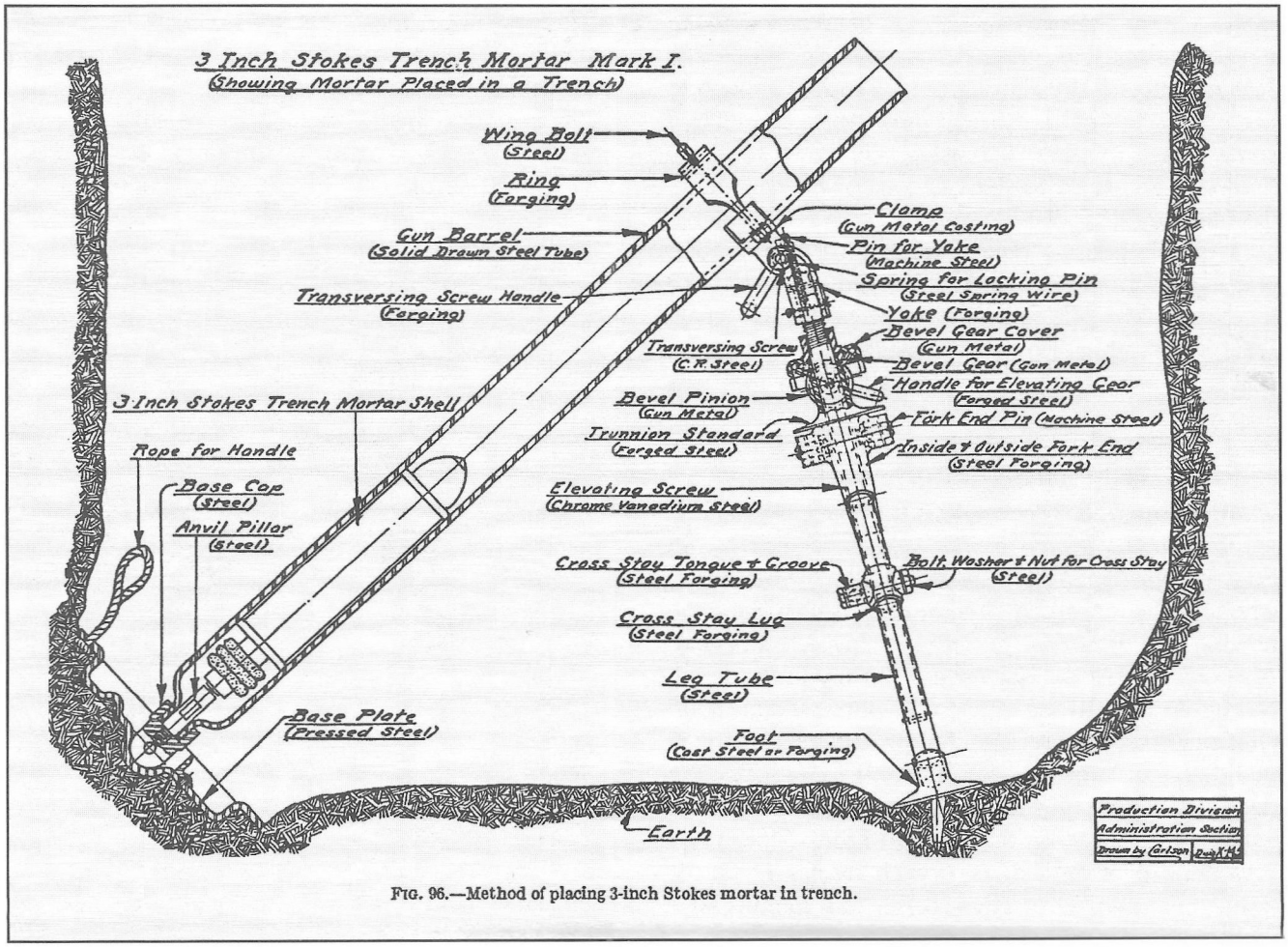


FIG. 96.—Method of placing 3-inch Stokes mortar in trench.

Drawing of sectionalized 3" Stokes mortar showing various components. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

minimum safe range was about 100 yards. The range was adjusted by varying the amount of explosive propellant attached to each shell (or "bomb") and adjusting the tube's angle of elevation. The mortar was sighted by the simple expedient of lining it up with the target by means of a white line painted on the tube.

The Stokes mortar shell was loaded by dropping a shell down the tube (barrel). The shell fired by means of a shotgun-like blank cartridge that exploded when it hit a fixed firing pin attached to the base cap. The exploding cartridge ignited propellant rings attached to the shell. The ammunition used with the weapon was variously termed "shell," "round" or "bomb" in contemporary military manuals.

The Stokes mortar was soon tested by the British Army and was deemed "...a brilliant concept." However, it was determined that the war currently raging in Europe would soon be over and there would not be time to produce the new weapon before the fighting ended! However, these pundits were soon proven dreadfully wrong and in the spring of 1915 the "3-inch Stokes Trench Mortar, Mark I" was adopted by the British Army. However, the production of other types of munitions was perceived as having higher priority, and manufacture of the Stokes mortars and shells was delayed. Eventually, sufficient numbers of these weapons were made and they began to see front-line service by late 1916. The first recorded use of Stokes mortars by the British was near Loos, France, in September where they proved to be very valuable weapons despite the limited numbers available. By this time, however, the British Army had begun to reduce its emphasis on rapidly moving infantry advances in favor of holding static trench positions. This strategy reduced the effectiveness of the highly mobile Stokes mortar and spurred the development of larger and more powerful, but relatively immobile, mortars. Even though the front-line "Tommies" liked the Stokes mortar, the British Army considered it a low-priority weapon and production remained limited.

Such was the situation when the United States entered the war. As we have discussed, the Americans were determined not to become mired in protracted static trench warfare and desired to utilize aggressive, rapidly moving infantry tactics. It was soon realized that the Stokes mortar would be ideal for the Doughboys and the weapon was soon approved for adoption by the U.S. Army. The weapon was known in British service as the "3-inch Stokes mortar," Mark I, and the U.S. Army designated it as the "3-inch trench mortar, Mark I."

There were not sufficient numbers of British Stokes mortars and ammunition to equip the U.S. infantry units, but our allies agreed to produce the weapon under contract for the American government. The production rate of the British firms involved in Stokes mortar manufacture was not adequate to meet the high demand of the rapidly growing AEF. In order to boost the production rate, approval was granted for the Stokes mortar to be manufactured in the United States.

The initial contract for production of the Stokes mortar in the United States was given to the Crane Company of Chicago on November 8, 1917. The firm received a contract for 1,830 Mark I trench mortars. Crane subcontracted production of the mortar barrels to the Ohio Seamless Tube Company of Shelby, Ohio. However, this company was in the process of working on prior contracts for the Navy, and production of the mortar tubes was delayed. In the meantime, the Crane Company worked on the other components such as base plates, bipods and ancillary items. By the spring of 1918, mortar barrels began to be shipped to Crane, and completed mortars were available for preliminary testing prior to general issue. There were some problems encountered during testing due to barrels becoming deformed and base plates breaking during test firing. It was eventually determined that the composition of the propellant charges was defective, and another type of propellant was substituted. This eliminated the problems and the mortars began to be delivered to the government. The first batch of eight mortars was delivered to the government on February 18, 1918, and a total of 1,184 mortars had been delivered by June of the same year. The Crane Company eventually reached a maximum daily production of thirty-three mortars, and the original contract of 1,803 mortars was completed on November 7, 1918. In the fall of 1918, additional contracts for Mark I mortars were given to Crane for 677 mortars and the International Harvester Company of Chicago for another 200. However, the war ended before any mortars could be built under these later contracts which were cancelled in December of 1918. Most of the 3" Stokes mortars used by U.S. troops during the war were British made. According to a War Department document, the United States procured 914 Stokes mortars from the British for issue to the AEF. Although 843 American-made 3" Stokes mortars were delivered to France before November 11, 1918, few actually made it into front-line combat before the Armistice. The remaining American-made 3" Stokes mortars were used for training purposes stateside.

The British 3" Stokes mortars had an oval base plate and those made in the United States were equipped with a rectangular base plate. Otherwise, the two types were virtually identical. After WWI, the British-made Stokes mortars in U.S. service were

Doughboys in France training with a Stokes 3" trench mortar in late 1918. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

normally retrofitted with the rectangular base plate.

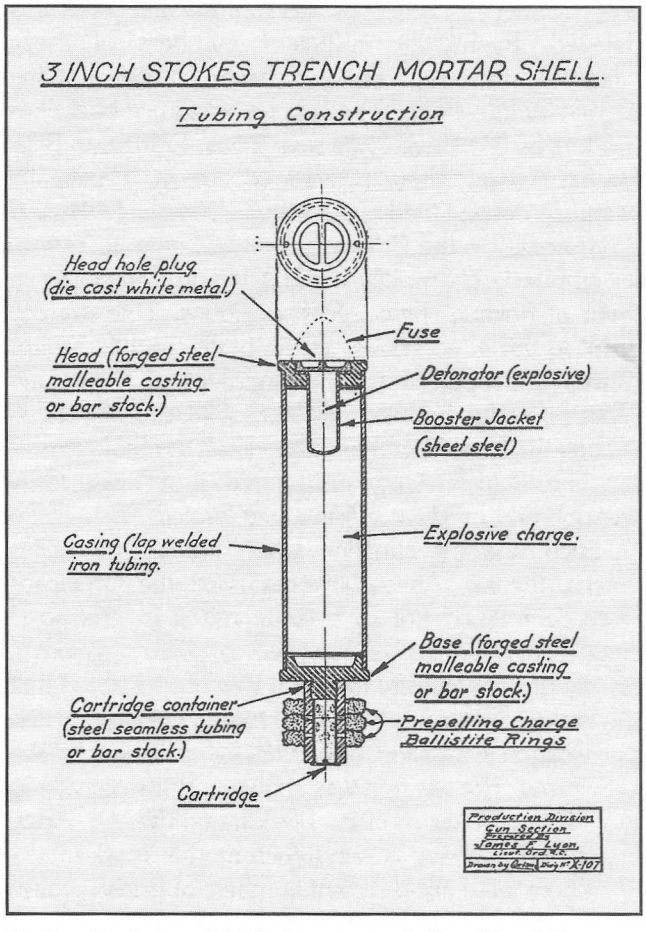
There were two standard types of 3" Stokes trench mortar shells authorized for use with the weapon during World War I. The primary type used was the "Mark I" high-explosive shell. It weighed about 11 pounds, 11 ounces, and was filled with approximately 2¾ pounds of "Trojan" nitrostarch explosive compound. TNT was also approved but seldom used. The shell was fitted with the "Mark VI" fuse. The Mark VI was an "all ways" impact fuse designed to detonate regardless of the velocity or angle with which the shell hit the ground. The Mark I explosive shells were painted gray or khaki with a three-inch yellow or red band painted around the body. The shell was equipped with a "safety pin" that was removed prior to dropping the shell into the mortar tube. The "Mark III" practice shell was produced and issued for training purposes. This shell was filled with about 2.15 pounds of sand and a black powder "booster" that produced a puff of white smoke upon impact. The weight and ballistic performance of the Mark III practice round simulated that of the Mark I high-explosive shell. The practice shell was painted dark blue and stenciled in white letters "Practice" on the body.

Three-inch Stokes mortar smoke shells for screening purposes and some white phosphorus shells were tested in limited numbers. There was also some experimentation done with toxic gas shells for the weapon. The 3" Stokes mortar gas shells were usually painted with a pink or green band on the outside of the body for identification purposes. The various types of chemical/gas shells could hold up to seven pounds of chemical compound. This was deemed insufficient, and the 3" Stokes trench mortar was seldom employed as a smoke or chemical agent projector. Therefore, the only type of 3" Stokes trench mortar shell to see any significant combat use was the "Mark I" high-explosive shell. The 4" Stokes mortar (see page 253) was developed as a chemical warfare weapon.

The 3" Stokes trench mortar propelling cartridges used by the U.S. resembled shotgun shells and were color-coded red, green or blue depending on the respective power of the charges. Tables were contained in field manuals that listed the range and "time of flight" according to the type of cartridge and the number of "ballistite" propellant rings that were attached to the shell. Up to four of the donut-shaped propellant rings could be attached to a 3" Stokes mortar shell.

The following description of the 3" Stokes mortar was contained in the War Department publication *Light Trench Mortars*, published December 1917:

The light trench mortar is essentially a trench artillery weapon of limited range which will render very efficient service when properly emplaced and skillfully handled and served.



Sectionalized view of 3" Stokes mortar shell, or "bomb." (U.S. Army, courtesy Konrad F. Schreier, Jr.)

World War I U.S. Army mortar unit preparing to fire their 3" Stokes mortar. Note the shells and packing case in the foreground. (National Archives)

U.S. troops firing a 3" Stokes trench mortar, Chaumont, France, October 16, 1918. (National Archives)

The light trench mortar is very mobile. Its effect against material is inconsiderable, but is particularly effective against massed troops, or troops driven into the open, due to its rapidity of fire. These mortars are used to form a barrage behind the hostile line to prevent reserves and ammunition being brought up. Owing to their high mobility, limited only by the difficulty of ammunition supply, they are especially fitted to accompany the infantry as it advances and are used to attack machine-gun shelters and other points which have temporarily checked the forward movement of the infantry.

It is difficult to overstate the importance of the Stokes mortar. As aptly stated by Konrad Schreier, Jr.:

...the 3-inch Stokes mortar revolutionized infantry tactics. It gave infantry a weapon with the power of the basic 3-inch field gun and yet it could be man-carried onto the battlefield.

It was used by every AEF infantry combat division and for training both in France and the USA. At the war's end it was considered an essential infantry support weapon and consideration was given to doubling the number per division.

Certainly, the Stokes 3" mortar was an extremely important weapon for the American troops of WWI. The U.S. Army formed "Howitzer Companies" attached to each infantry regiment. Each howitzer company was equipped with three Mark I trench mortars and three M1916 37mm guns (to be discussed on page 257). The official TO&E requirements for a U.S. Army Infantry Division in 1918 was thirty-six 3" Stokes trench mortars. However, if was not unusual for the actual number of weapons used to exceed the official allowance. For example, it is reported that the 42nd ("Rainbow") Division had at least forty-eight 3" Stokes mortars in its inventory by the end of the war.

The 3" Stokes mortar was normally hand carried, but some were transported in horse-drawn machine gun carts. The Marine Corps sometimes utilized their Cole handcarts to carry mortars. Some experimentation was done by the Army with mounting mortars on Ford Model-T trucks, but such "mobile mortar platforms" were never used in battle.

One valuable feature of the 3" Stokes mortar was its rapidity of fire. The weapon had a maximum rate of fire of 30 rounds per minute and a sustained rate of fire of six to ten rounds per minute. Sustained firing required that the tube be periodically swabbed out (every five rounds or so) to reduce fouling in the bottom of the tube. Nevertheless, the 3" Stokes mortar could keep up prolonged fire as long as its ammunition supply and the stamina of the mortar men held up.

U.S. troops training with the Stokes 3" mortar. Note the shell in positon ready to drop in the tube. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

Numerous contemporary reports and postwar unit histories relate the effective use of Stokes mortars by the AEF. A typical example was related in the book *Father Duffy's Story* by Francis P. Duffy:

When Colonel Donovan called for the Stokes Mortars to repel the threatened counter-attack on the morning of the 15th, the pieces were set up under the slight protection of the sloping ground, but from this point the gunners could not observe the accuracy of their own fire. So Sergeant Fitzsimmons ran forward to the top of the slope, making himself an easy cockshot for the German gunners while he signaled to his own men his corrections on their aim. He escaped himself by a miracle and had the satisfaction of seeing the shells dropping amongst the Germans who were gathering for the attack, and doing dreadful execution.

A report from the 42nd Division depicted a rather novel method of firing the mortar:

I took the Stokes and held the barrel between my legs, had one man to load and the other man to help him. Our first shell made a direct hit and caused the enemy a lot of casualties in their ranks. I continued firing as fast as I could with the Stokes... We broke up the counter-attack.

Several dispatches from the 89th Division also contained examples of effective use of the Stokes mortars:

The Stokes Mortar Platoon, under Lieutenant Leedy, went into action at Hois de Mort Marc putting three machine guns out...

In this regiment, one enemy cannon, cal. 88, and its entire gun crew was cut out of action by a direct hit from a Stokes mortar at a range of about 500 yards.

It was found that the moral effect of fire from

Stokes Mortars and rifle grenades on machine gun nests was very great.

Where these mortars were put into action they served boldly and with good result.

There were some instances reported of Doughboys using mortar shells by removing the safety pin and then throwing them in the manner of large hand grenades. Due to the power of the 3" mortar shell as compared to a hand grenade, this practice, while effective at times, was fraught with danger. An interesting example of this method of using Stokes mortar shells was related in a dispatch from the 51st Infantry Brigade of the 26th Division:

One of the most effective uses of trench mortar shells was to carry a couple of them with time-fuses attached and drop them down the vent shaft, or chimney, or throw them down the stairway of a Heine dugout. There would be a dull thud and then — silence.

Another instance in which mortar shells were employed in this daring manner is mentioned in *The Doughboys*:

...Sgt. Earl D. Gregory...carried a rifle and bayonet for protection, but relied mainly on a mortar shell, which he toted like a log of wood, as his prime weapon. Three of the enemy were left alive after the sergeant threw this pineapple into a machine-gun nest, and they surrendered...

The only recurring negative aspect of the trench mortars was the difficulty experienced at times with maintaining sufficient supplies of mortar rounds. This is mentioned in a dispatch from the 102nd Infantry Regiment of the 26th Division:

...Like the hand-grenade each of these weapons (Stokes mortars) offered a problem in transportation and ammunition supply...

However, problems with the supply of ammunition does not seem to have negatively affected the performance of the Stokes mortar during the war. A few French-made 58mm mortars were also reportedly acquired by the AEF, but these were very few in number and saw extremely limited use as compared to the 3" Stokes mortar.

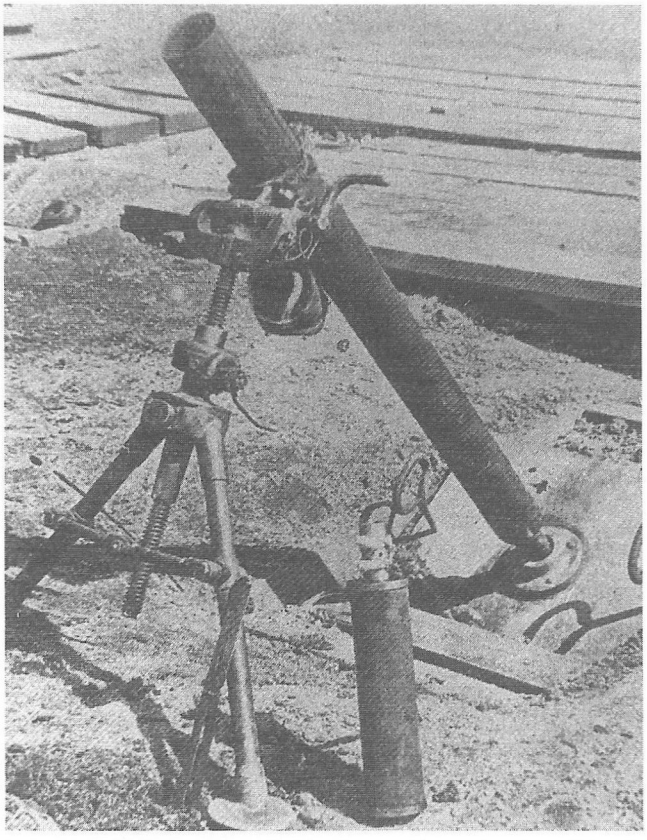
By the time of the Armistice, the 3" Stokes trench mortar was an integral part of the armament of the AEF. After the war, the weapon remained a standard item of issue. Most of the 3" Stokes mortars in the military's inventory were subsequently modified by the addition of improved bipods and sighting apparatus. The 3" mortar was supplanted prior to WWII by the 81mm mortar although some of the modified First World War vintage mortars remained in use through 1945.

4" Stokes Mortar

While technically not classified as an "infantry weapon" by the U.S. Army, since it was assigned to the newly formed Chemical Warfare Service, the 4" Stokes mortar will nevertheless be mentioned briefly in order to give a complete picture of the trench mortars employed by the AEF. The 4" Stokes mortar was developed by the British because the original 3" variant was not large enough to be effectively used as a projector for gas and other types of chemical rounds.

The 4" Stokes mortar and its ammunition were essentially enlarged versions of the 3" model, and it was selected by the British because it was believed that this was the largest size that was relatively mobile and could be fired rapidly.

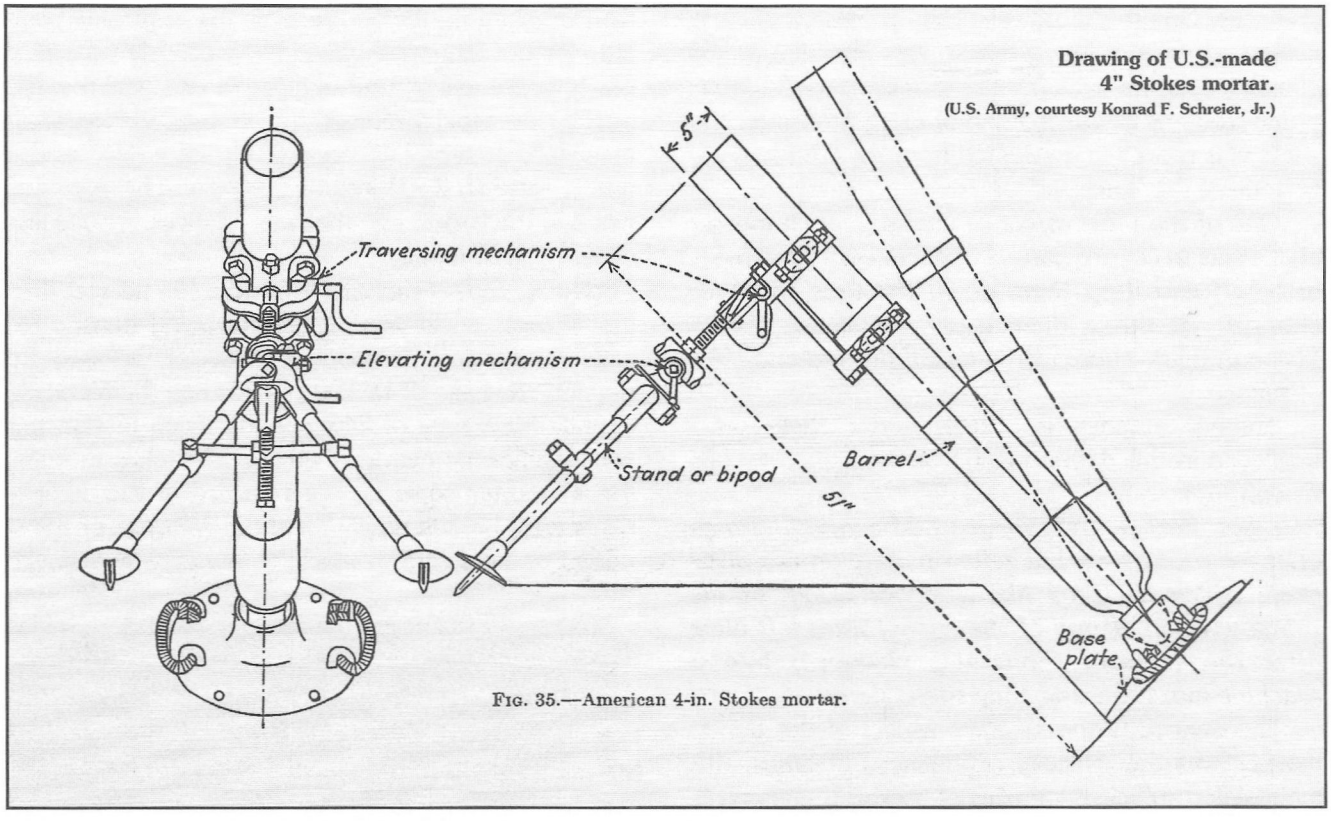
The 4" Stokes mortar was somewhat heavier than the 3" version yet was capable of being transported without extreme difficulty. The barrel weighed 90 pounds, the base plate 120 pounds and the bipod 32 pounds for a total of 242 pounds. Even though this was significantly heavier than the 3" Stokes mortars, the 4" mortar could be hand carried (if the components were broken down) for short distances or transported on horse-drawn machine gun carts and similar



Four-inch Stokes mortar. Unlike the smaller and lighter 3" variant, this weapon was often used to deliver smoke and gas shells. Note the shell in the foreground. This example was made by the British. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

conveyances. The weapon was viewed as a compromise between the smaller and lighter 3" trench mortar and the much heavier and more powerful 6" mortar.

In the AEF, the 4" Stokes mortar was often called the "4-inch Chemical Mortar." It fired at about the same rate as the 3" version, yet the shell could hold almost three times the volume of chemical compound as the smaller shell. There were six active U.S. Army Chemical Warfare mortar companies by the end of the war equipped with the 4" Stokes mortars. The first recorded use of this weapon by Americans was in July of 1918 by two companies of the 1st Gas Regiment



Drawing of U.S.-made 4" Stokes mortar.
(U.S. Army, courtesy Konrad F. Schreier, Jr.)

FIG. 35.—American 4-in. Stokes mortar.

U.S. Army Chemical Warfare Service troops firing 4" Stokes mortars with "Thermit" shells, Yonne, France, March 5, 1918.
(National Archives)

firing white phosphorus shells for smoke screening purposes. The only gas mortar shells available to the American CWS units were British made. In addition to the WP shells, there were incendiary and toxic gas shells produced. The gas shells were fitted with an instantaneous impact fuse, and the incendiary and smoke shells had time fuses. The maximum range of the 4" mortar was about 1,100 yards. The rate of fire was between 20 to 25 rounds per minute with a sustained rate of about 5 rounds per minute. High-explosive shells were requested for the 4" mortars but none made it overseas before the end of the war, and the 4" mortar's use was strictly to deliver smoke and chemical munitions.

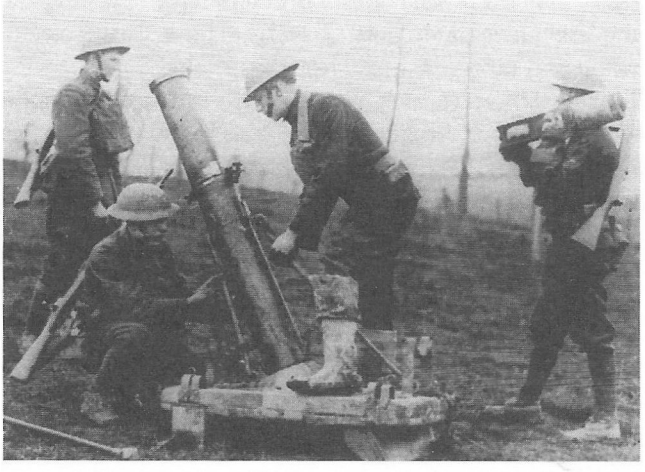
The 4" mortar remained in the U.S. Army's Chemical Warfare Service inventory after the war. Although superseded by the 4.2" chemical mortar, some of the WWI variants remained in limited training use as late as the Second World War.

U.S. soldier preparing to test fire a 6" Newton mortar at Aberdeen Proving Ground. Note the much larger size as compared to the 3" or even 4" Stokes mortars. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

6" Newton Mortar

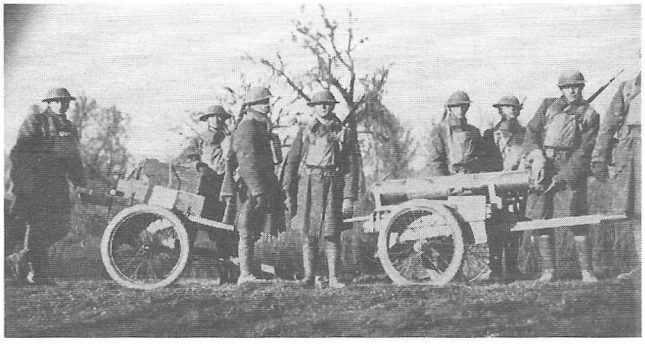
Before we leave the subject of mortars, brief mentioned should be made of the 6" Newton mortar. Although the size and weight of this mortar precludes it from being classified as an "infantry weapon" as defined in this book, it was significant as an infantry fire-support weapon. Like the Stokes mortars, the Newton was originally developed by the British and adopted by the Americans. The weapon required the use of a separate base, platform and "sub-base" which made for a heavy and cumbersome package. The 52" barrel weighed 162 pounds, the base 75 pounds and the platform 160 pounds. The "sub-base" weighed a staggering 530 pounds. The loaded high-explosive shells weighed about 53 pounds and could be fired at a maximum distance of approximately 1,700 yards.

Initially, the 6" Newton mortars were mounted on motorized "Jeffery Quad" 4x4 trucks. However, this did not allow the weapons to be moved easily into front-line trench positions, so the AEF's Trench Mortar School developed modified U.S. Marine Corps Cole carts on which to transport the various components. This worked out reasonably well and enabled the 6" mortar to be moved forward to support the troops. While not nearly as mobile as the 3" Stokes, the weapon was certainly easier to move than a typical artillery piece. However, the bulk and weight limited its use as a close-support infantry weapon. There were 513 of the 6" Newton mortars acquired from the British, and 48 American-made models were sent to France before the end of the war. The weapon was not used after World War I due to its lack of mobility.



Six-inch Newton mortar being prepared to fire. Note the size of the base platform. (U.S. Army, courtesy Konrad F. Schreier, Jr.)

Six-inch Newton mortar being transported on a handcart. (U.S. Army, courtesy Konrad F. Schreier, Jr.)



Six-inch Newton mortars on handcart with ammunition limber.
(U.S. Army, courtesy Konrad F. Schreier, Jr.)

Other Infantry Trench Mortar Developments

On the other end of the spectrum from the large 6" Newton mortar, the U.S. Army experimented with both 45mm and 60mm trench mortars. The small and very portable 45mm mortar was tested as a possible replacement for the rifle grenade launcher. The weapon was developed by the Edgar Brandt Company of Paris, France, and was submitted for testing by the French Army in July of 1918. The tests were also witnessed by representatives from the AEF.

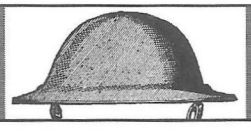
The 45mm mortar fired in much the same manner as the larger 3" Stokes mortar. The barrel (tube) had a small circular base plate attached to the bottom. The weight of the weapon was only 8.8 pounds and the total length was 28". It fired a 1.2 pound explosive round at a maximum distance of 1,100 yards. The French were very impressed with the weapon and ordered 1,000 from the Brandt firm.

The Brandt Company also developed a 60mm mortar that was essentially an enlarged version of the 45mm mortar. The experimental 60mm mortar weighed about 19.3 pounds with a total length of 40". It fired a 2.8 pound explosive shell to a maximum distance of 1,350 yards. Like the 45mm variant, the 60mm mortar could be carried by one man. However, the French declined to adopt the 60mm version since it was felt that either the 3" Stokes mortar or the newly adopted 45mm version could perform its function.

Two of the 45mm and two 60mm Brandt mortars along with 1,000 rounds of each ammunition were sent to the Aberdeen Proving Ground for testing. The war ended before extensive trials could be conducted, and further consideration of the light mortars was shelved. The 60mm mortar was eventually adopted by the United States on the eve of the Second World War. In any event, none of the 45mm or 60mm mortars were issued to units of the AEF.

As can be seen, even though other mortars saw service, the 3" Stokes was *the* infantry trench mortar of the American Expeditionary Force in World War I. The weapon was respected by our troops and feared by our adversaries. The brilliance of Sir Stokes' design is apparent in the fact that modified versions of the weapon are still in use today. Not a bad record for a weapon that wasn't even in existence before 1914. The 3" Stokes trench mortar is one of the classic U.S. infantry weapons of the First World War.

Collector Notes



Even though fair numbers were manufactured, there are extremely few 3" Stokes mortars in existence today. Most military museums lack an example and only a handful are in private collections. The fact that the Stokes mortars remained in postwar service meant that the supply was eventually used up and discarded. Most were modified during the 1920s and 1930s, and the weapon was "Substitute Standard" through most of the Second World War. The few remaining on hand at the end of WWII were destroyed. Thus, almost none of the weapons survived intact.

Fairly large numbers of WWII-vintage 60mm and 81mm mortars, either live or "demilled," are around and available to today's collectors. Unfortunately, this is not the case with the WWI-vintage 3" Stokes mortars. Any live mortar is classified as a "Destructive Device" and requires registration under the National Firearms Act. Live mortar shells also fall into this category. Of course, inert shells can be owned with no federal restrictions.

The "demilling" process for mortars involves welding the base cap to the tube, welding metal rods inside the tube and milling a hole into the tube at least the diameter of the bore. Thus modified, such a weapon is incapable of firing, or being reasonably restored to firing condition, and is not subject to any federal regulations.

Any registered live or professionally "demilled" 3" Stokes trench mortar would be a very rare weapon and a wonderful addition to a collection. The value of the British version and American version would likely be fairly close, although most collectors would probably prefer the latter if given a choice. However, any legal Stokes mortar is an extremely desirable collectible. The same holds true for the 4" Stokes and 6" Newton mortars although they are even rarer than the 3" Stokes.

As a result, collector interest in the WWI mortars is virtually nil. This is not due to the lack of collectibilty but, rather, the fact that almost none are around to whet the appetites of collectors. It is unfortunate that such a classic infantry weapon of WWI is essentially unavailable to today's collectors.

M1916 37mm Gun

Even though it was a widely used and very effective weapon, the M1916 37mm gun is all but unknown to many people with an interest in the subject of WWI infantry weapons today. This fascinating piece of ordnance shares some parallels with the 3" Stokes trench mortar. Both were part of the standard issue for U.S. Army AEF "Howitzer Companies" and both were originally developed and adopted by our allies.

The 37mm gun actually has a surprisingly long history. The United States Army and Navy had utilized the Hotchkiss 37mm revolving cannon as far back as 1875. The French Navy also developed similar 37mm cannons during this same period.

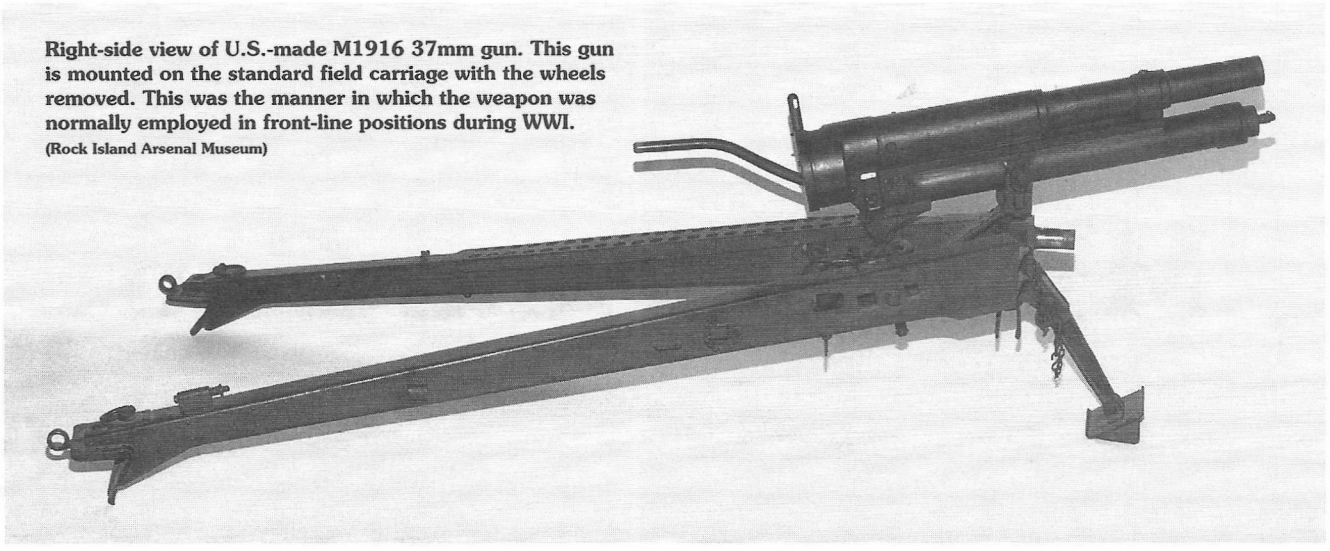
When the war broke out in 1914, the French found that these old 37mm guns could be useful for engaging German machine gun positions. There were some interesting improvisations done which involved mounting these almost ancient naval weapons on cobbled-together carriages with crude sights added. While these makeshift weapons showed much promise, it was obvious that a more modern 37mm gun was required.

In 1915, the noted French Army ordnance engineer, Major Garnier, was assigned as head of the project to develop a lightweight 37mm gun for trench warfare. A somewhat similar 37mm weapon had been designed at the large French Puteaux Arsenal in 1885, but some additional developmental work was needed to modernize the original design. Major Garnier tackled the project, and the new weapon was ready for testing and evaluation in early 1916. The new 37mm gun was tested by the French Army and was quickly approved for adoption as the "37mm Gun, Model of 1916." The weapon was designated as an "infantry accompanying gun" and its stated primary purpose was to engage and destroy machine gun nests and other enemy positions. The weapon soon proved to be very adept at its assigned tasks and was quite popular with the French troops.

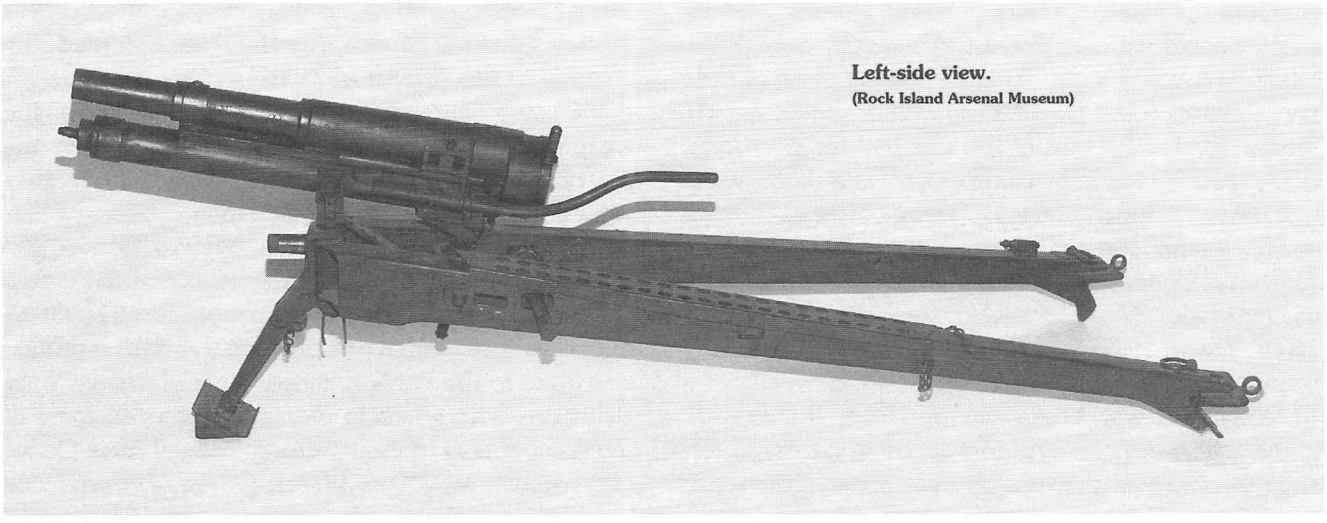
The usefulness of the M1916 gun was not lost on the American Army. After observing its effectiveness in the trenches of France, the U.S. adopted the weapon as the "Model of 1916" in October of 1917. Plans were immediately formulated to have the weapon manufactured in the United States. In the meantime, some 620 French M1916 37mm guns were purchased for issue to the AEF.

It was agreed that the new M1916 37mm gun could be more efficiently mass-produced in the U.S. if the component "groups" were manufactured by different firms. The contract to produce the "barrel group" was given to the Poole Engineering & Machine Co. of Baltimore, MD, which in turn, subcontracted some of the components to the Maryland Pressed Steel Co. of Hagerstown, MD. The "breech group" was produced by the Krasberg Manufacturing Co. of Chicago, IL. The recoil mechanism was built by the C.H. Cowdrey Machine Works of Fitchburg, MA. The axles and wheels of the carriage were made by the International Harvester Corp. of Chicago, IL, and the "trails" were made by another Chicago firm, the Universal Stamping & Manufacturing Co. The external metal parts of the gun were painted olive drab green. The various components were shipped to the Maryland Pressed Steel facility for assembly and testing. The firm built a special test-firing range about eight miles from the factory. Some were also tested at the Aberdeen Proving Ground which was in fairly close proximity to the factory. Upon the completion of all tests and inspections, each gun was crated for shipment overseas. An ammunition cart (a modified M1917 horse-drawn machine gun cart) was crated and shipped along with each gun. The entire crated unit weighed 1,550 pounds including the gun, carriage, ammunition cart and all accessories.

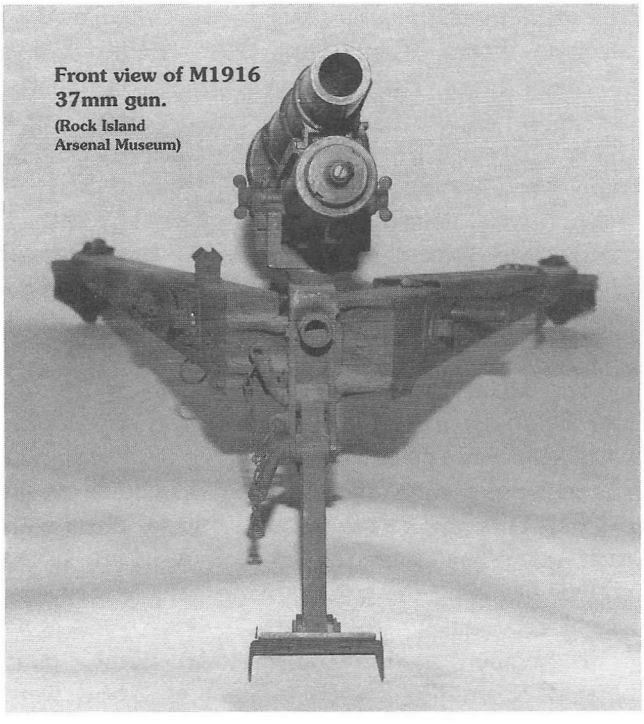
In addition to the 620 M1916 37mm guns obtained from the French, a total of 2,598 were



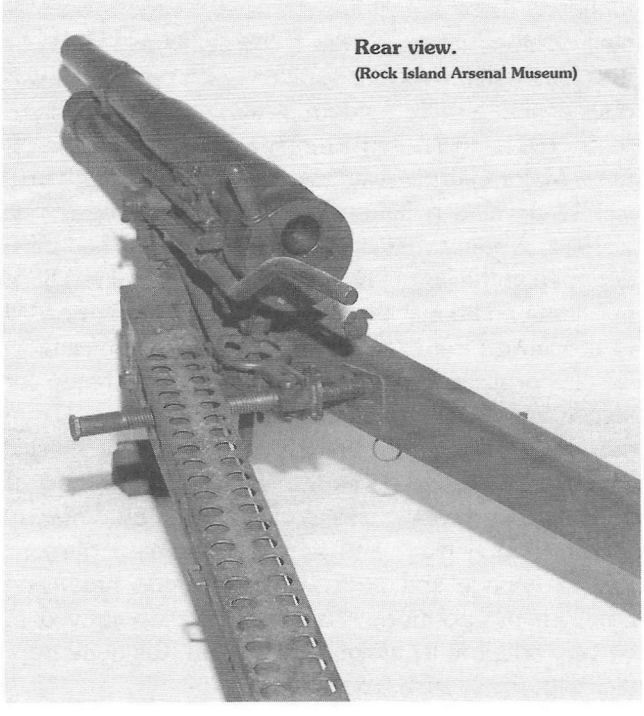
Right-side view of U.S.-made M1916 37mm gun. This gun is mounted on the standard field carriage with the wheels removed. This was the manner in which the weapon was normally employed in front-line positions during WWI.
(Rock Island Arsenal Museum)



Left-side view.
(Rock Island Arsenal Museum)



Front view of M1916 37mm gun.
(Rock Island Arsenal Museum)



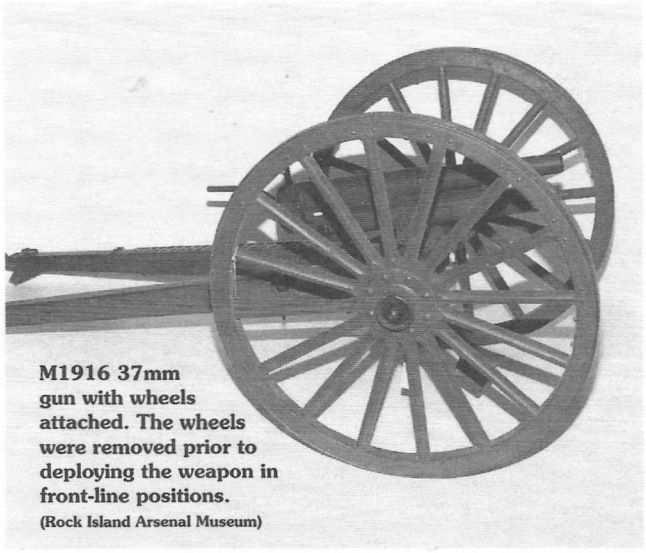
Rear view.
(Rock Island Arsenal Museum)

ordered from the U.S. firms. Of this number, about 300 were delivered to the AEF prior to the Armistice, although only 60 are reported to have actually reached front-line Doughboy units before the end of the war. A total of 884 American-made M1916 37mm guns were made prior to all contracts being cancelled after the war. Some of the French-made M1916 37mm guns were equipped with conical-shaped flash hiders, but this item was rarely, if ever, used on the American-made guns.

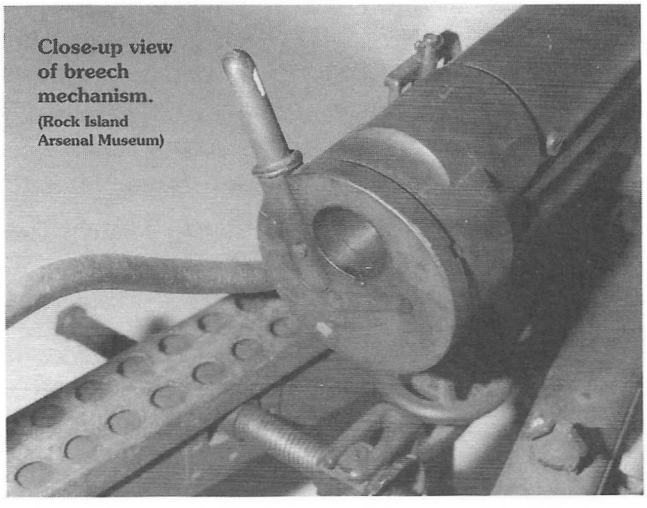
The M1916 37mm gun was officially considered by the U.S. Army to be as mobile as the M1917 .30 caliber Browning machine gun or the 3" Stokes mortar. The weapon, on its basic tripod carriage, weighed about 170 pounds. This load could be divided into two sections — the gun itself weighing about 105 pounds and the tripod carriage weighing about 64 pounds. This enabled the weapon to be man-carried into position without an extreme amount of difficulty. Also, the carriage could be fitted with a pair of detachable spoked wheels to enable it to be towed behind a mule or horse-drawn ammunition cart. The ammunition cart carried up to 224 rounds of 37mm ammunition along with the necessary tools and spare parts. The addition of the wheels was fine for traversing relatively level ground but was rarely used to transport the weapon in front-line trench operations. The wheels were removed when the gun was placed into position in order to lower its profile to aid in concealment. The entire gun, complete with the wheels and axle, weighed about 340 pounds.

The M1916 gun was normally sighted by means of a telescopic sight. For indirect fire a collimating sight (quadrant sight) was used. Two types of ammunition were produced for the M1916 37mm gun. The first type, designated as the "Mark I," used a cast-iron shell. It was termed a "low explosive" shell and contained a charge of black powder. The second type of shell, "Mark II," was steel construction with a high-explosive charge of TNT. The both types of shells contained 240 grains of explosive charge (black powder or TNT). The Mark I shell was fitted with a percussion impact nose fuse, and the Mark II had a base impact-detonating fuse. Loaded shells weighed about 1.2 pounds each. There were also a relatively small number of armor-piercing 37mm shells obtained from the French, primarily for antitank use. Interestingly, some of the old 37mm shells of late 19th-century vintage were still on hand and used for training purposes by the U.S. Army.

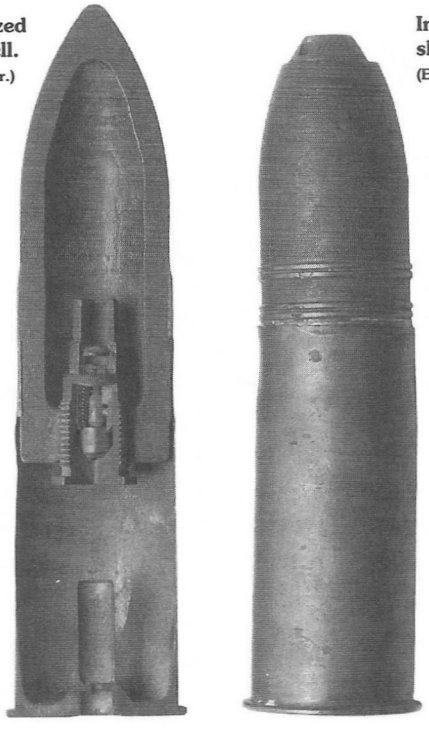
The Mark I low-explosive shell was less satisfactory for combat than the Mark II high-explosive type. However, the AEF was forced to obtain 37mm shells



M1916 37mm gun with wheels attached. The wheels were removed prior to deploying the weapon in front-line positions.
(Rock Island Arsenal Museum)



Close-up view of breech mechanism.
(Rock Island Arsenal Museum)



Sectionalized 37mm shell.
(E.F. Furler, Jr.)

Inert 37mm shell.
(E.F. Furler, Jr.)

One of the most published photos of the First World War. This shot shows a 37mm gun crew of Headquarters Company, 23rd Infantry, 2nd Division in action. (National Archives)

from the French until the American-made shells became available. There were troubling shortages of the high-explosive type shells in the AEF, and about 95 percent of all 37mm shells actually used by our troops in France were of the Mark I low-explosive type. Although over six million Mark II high-explosive 37mm shells had been ordered, only about 10,000 had been completed by the Armistice but none of these had been shipped overseas. Therefore, only the high-explosive 37mm shells obtained from the French were available to the Doughboys during the war. Despite their inferiority as compared to the high-explosive shells, the Mark I low-explosive rounds reportedly had one advantage. The puff of black powder smoke enabled gunners to observe misses and make the necessary sighting corrections easier than with the high-explosive shells. The Mark I shells were also the primary type used in training. There were many contentious cablegrams sent to the U.S. from General Pershing's staff requesting expedited deliveries of 37mm ammunition. One such missive dated May 14, 1918, from Pershing indicated that "...all types of 37-mm ammunition urgently needed, as the French could not deliver any type to the United States depots, nor any high-explosive shells to United States combatant troops, and were delivering cast iron and armor-piercing shells to combatant troops in limited quantities only..."

Contracts to manufacture the Mark I and Mark II 37mm shells were awarded to the Poole Engineering Co. along with the Sterling Motor Co. of Brockton, MA, and the Toledo Screw Products Co. of Toledo, OH. The American-made 37mm shells were very similar to the French types but can be distinguished by the different head stamps. Also, the U.S. shells had a single rotating band (a.k.a. "driving band") on the projectile, while the French shells had two copper rotating bands.

Other types of 37mm shells were in the process of being tested in the United States by the time the war ended. These included the same basic types of armor-piercing and canister shells as had been developed by the French during the course of the war. In order to facilitate shipment, storage and handling the 37mm shells were packed in cloth belts holding sixteen

rounds each, usually in 32-round boxes. None of the American-made 37mm shells of these types were delivered overseas before the end of the war.

The M1916 gun had a muzzle velocity of about 1,320 feet per second and a maximum range of 2,600 yards. The maximum effective range was about 1,500 yards. The accuracy of the weapon, aided by the telescopic sight, made it deadly against German machine gun nests and similar positions. Konrad Schreier, Jr. states:

I have fired this gun (M1916 37mm) a number of times. It is very accurate out to 1,000 yards and more. It is also very easy to use in direct-aim fire with its telescopic sight.

The M1916 37mm gun was manned by a two-man crew assisted by several observers and "ammunition passers." Like the 3" Stokes trench mortar, the M1916 37mm gun was part of the designated armament of a "Howitzer Company." Each company was to be composed of three "Howitzer Platoons" each armed with one M1916 37mm gun and one 3" Stokes mortar. However, there were insufficient numbers of M1916 guns available to meet the official requirements. The authorized TO&E requirements for M1916 37mm gun in a U.S. Army Infantry Division during WWI was twelve.

When the war ended, automatic (repeating) 37mm guns were being developed, primarily for aviation purposes. None of the automatic 37mm cannons were utilized by ground forces. A slightly modified version of

Left, head stamp of U.S.-made M1916 37mm shell. Right, head stamp of French-made 37mm shell.
(E.F. Furler, Jr.)

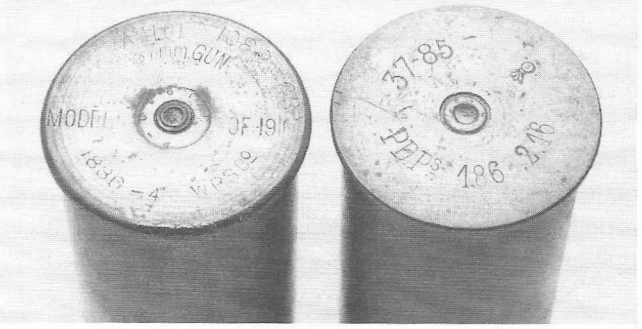
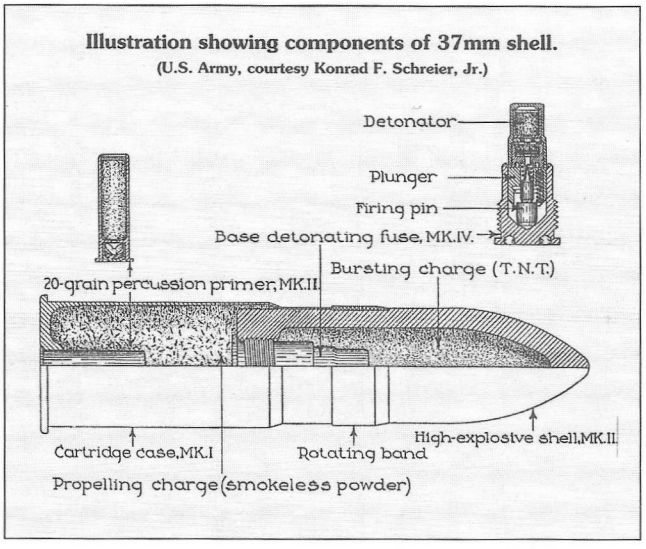


Illustration showing components of 37mm shell.
(U.S. Army, courtesy Konrad F. Schreier, Jr.)



U.S. Army 37mm gun crew in front-line position. Note the barbed wire in front of the emplacement and the shell in the hand of the loader, at left. The gunner is sighting through the telescopic sight and the observer is next to the gunner. (National Archives)

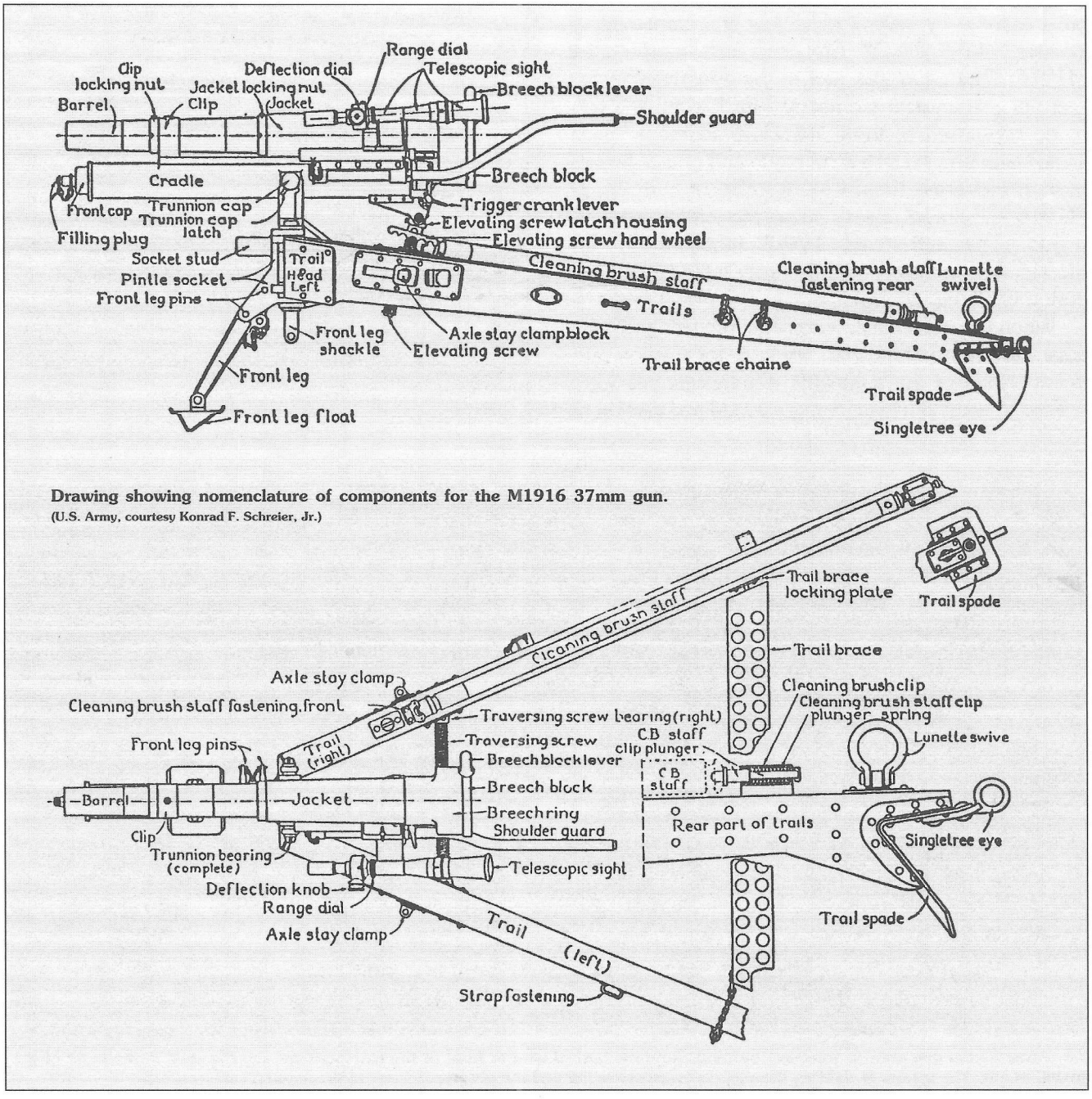
the M1916 37mm infantry gun was standardized for use in the American tanks of the First World War.

The M1916 37mm gun became as popular with the Doughboys as it was with the Poilus. In addition to its official "Model of 1916 37mm" designation, the weapon was known by many names, including the "one pounder," the "infantry accompanying gun" and simply "the thirty-seven." Many AEF dispatches contained examples of the weapon's effectiveness. A report from the 89th Division, 177th Infantry Brigade operating in the Meuse-Argonne sector mentioned:

The 37 mm. guns were used by both regiments with good effect. The guns went forward with the assaulting battalions in each regiment and when the lines were passed by the support battalions they went on with the new assaulting battalion. In both regiments these guns kept up and scored hits on machine gun nests.

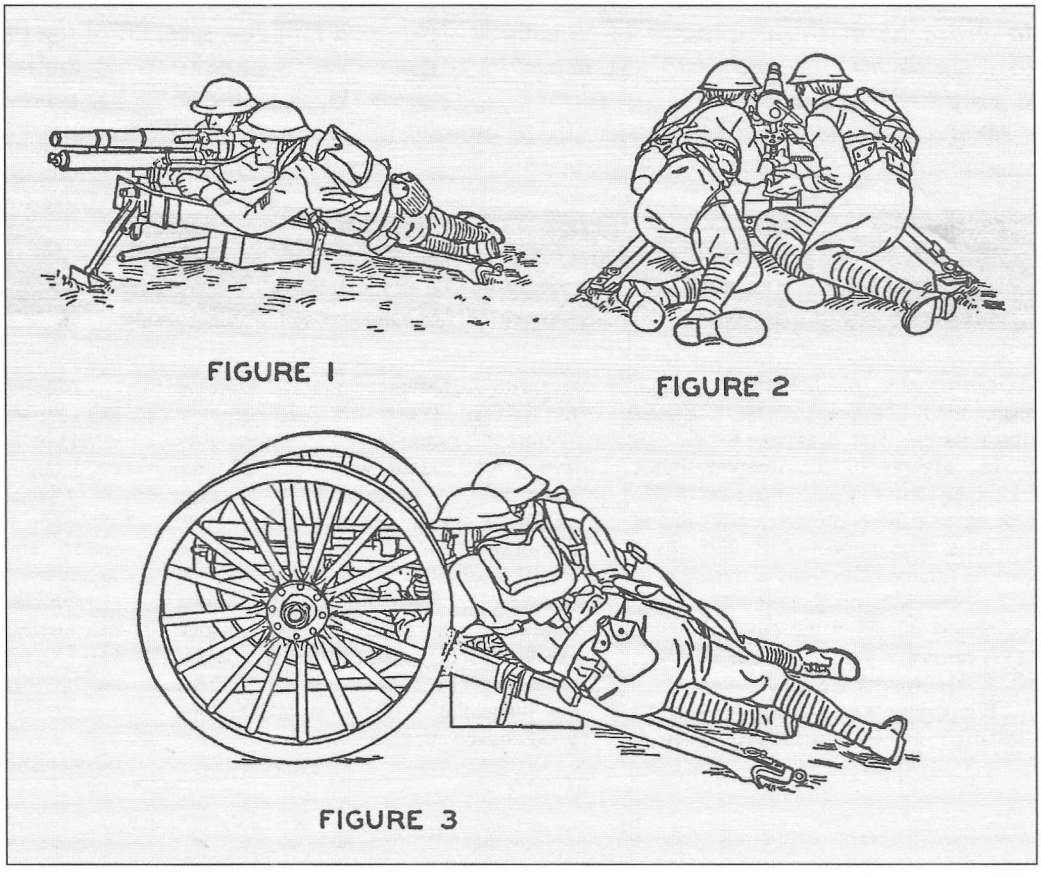
Another unit of the 89th Division reported similar effective use of the M1916 gun in the Meuse-Argonne fighting:

In the preliminary bombardment and initial advance of the Infantry on November 1st, these guns (37mm) were employed under the Divisional



Drawing showing nomenclature of components for the M1916 37mm gun.
(U.S. Army, courtesy Konrad F. Schreier, Jr.)

(above) U.S. troops of the 144th Infantry Regiment in France training with the M1916 37mm gun. Photo taken August 29, 1918. Note the shells contained on the cloth belt. This gun has been fitted with a metal protective shield that was not widely used.
(National Archives)



(right) Illustration from WWI U.S. Army training manual for M1916 37mm gun showing crew positions for various firing modes.
(U.S. Army, courtesy Konrad F. Schreier, Jr.)

Machine Gun Officer to good effect. They later joined their regiments, as did the machine gun companies. Throughout the open fighting of the operation the 37-mm. guns served a useful purpose. They were generally up with the assault battalions of the Infantry and the number of rounds fired (over 2,000) shows that they were frequently employed. This continued in the operation at Pouilly where several direct hits were reported.

General Hunter Liggett's postwar memoirs stated the following regarding the M1916 gun:

The infantry itself carried 37-millimeter, hand-drawn guns, which the doughboy called "toy cannon," for direct fire against machine-gun positions...

The book, *A Doughboy with the Fighting Sixty-Ninth* related the following regarding the M1916 gun:

In combat, Jack assisted Sergeant Willermin in the one-pound cannon platoon and he handled this 37mm piece as if it were a toy, making every shell count.

An article in the June 15, 1918, issue of *Arms and the Man* contained a two-page article very favorable to the M1916 37mm gun. The concluding paragraph of the article summed up the reputation of the weapon very well:

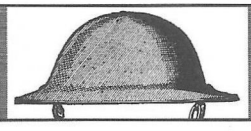
...the American infantryman has acquired an "accompanying cannon" which can be relied upon to prove as accurate a piece of unusually light artillery as his rifle and pistol are accurate, trustworthy small arms.

If the war had lasted even a few more months, large numbers of the American-made M1916 37mm guns and Mark II high-explosive shells would have been employed by our troops. Instead, virtually all of the fighting was done with French-made weapons and ammunition. In any event, the 37mm gun proved to be a capable and popular infantry weapon of WWI.

Following the war, the weapon remained standard issue for the U.S. Army. It was the primary infantry antitank weapon of the 1920s and 1930s. Subsequent advances in tank design eventually rendered the weapon ineffective for this use, and in 1939, it was made "Limited Standard" when the M3 37mm antitank gun was adopted. After 1941, the M1916 gun was relegated to training purposes only. It is known that some of these weapons were available to the beleaguered American and Filipino troops during their valiant but ill-fated defense of the islands during the 1941–1942 campaign. However, no specific use of the weapon in combat against the Japanese has been recorded.

Many of the First World War vintage M1916 guns were utilized as "sub-caliber" weapons for artillery training and practice use as early as the 1920s. Such use continued, to some extent, as late as WWII but was phased out by the time of the Korean War due to the depletion of spare parts and ammunition. Almost none of the weapons survived intact due to the widespread post-WWI use. Today, the M1916 37mm gun is almost a forgotten weapon of the First World War despite its very successful use in the conflict. Along with its stablemate, the 3" Stokes mortar, the M1916 37mm gun was a classic infantry support weapon of WWI.

Collector Notes



As can be seen, the M1916 37mm gun shares many parallels with the 3" Stokes trench mortar. This holds true for the collecting aspects of the weapon today. Extremely few complete weapons of this type are in existence, even in government museums. The number of M1916 37mm guns in private collections is even smaller, and the odds of obtaining one today are almost nil. Even the most advanced WWI collection generally lacks an example of this infantry weapon.

If an example were found, it would be classified as a "Destructive Device" requiring registration under the terms of the NFA. There are virtually no "demilled" examples noted either. Any live 37mm rounds would fall into the same category as hand grenades. Inert shells are fairly common. The empty 37mm shell casings were popular items for "trench art," and some may be encountered with amazingly intricate engraving or other embellishments. While obviously altered from their original configuration, such "trench art" shells are interesting collectibles and can be good conversation pieces.

Any live M1916 37mm gun (if properly registered) or "demilled" example would be a wonderful addition to a WWI collection. The French and American-made pieces would probably be worth about the same, although most U.S. collectors would probably prefer the latter. In any event, a collector shouldn't knock himself out trying to locate an example of this fascinating weapon, as such a quest will likely prove futile. The story of this "toy cannon" shouldn't be forgotten.

Flame Throwers

The final infantry weapon we will discuss is the flame thrower. Although the use of fire for warfare has its roots in antiquity, it was not until the First World War that the first practical flame throwers were developed. German engineers had worked on prototype portable flame throwers between 1900 and 1910 but it was not until 1915 that the first weapons of this type appeared in combat on the Western Front. The Germans first used their portable flame throwers against the French at Malencourt. While the flame thrower was initially terrifying to the French, there were also some drawbacks to the weapon. As stated in a *U.S. Army Chemical Warfare Service* book:

The employment of flame projectors as tactical weapons was a concept that appealed to the Western Front belligerents, perhaps not as a key to the

Doughboys of the U.S. Army 18th Infantry posing with captured German flame throwers. The caption on back of the original photograph read: "Liquid fire machines of the Germans" brought back from "No Man's Land" by American troops after a raid on March 6, 1918. (National Archives)

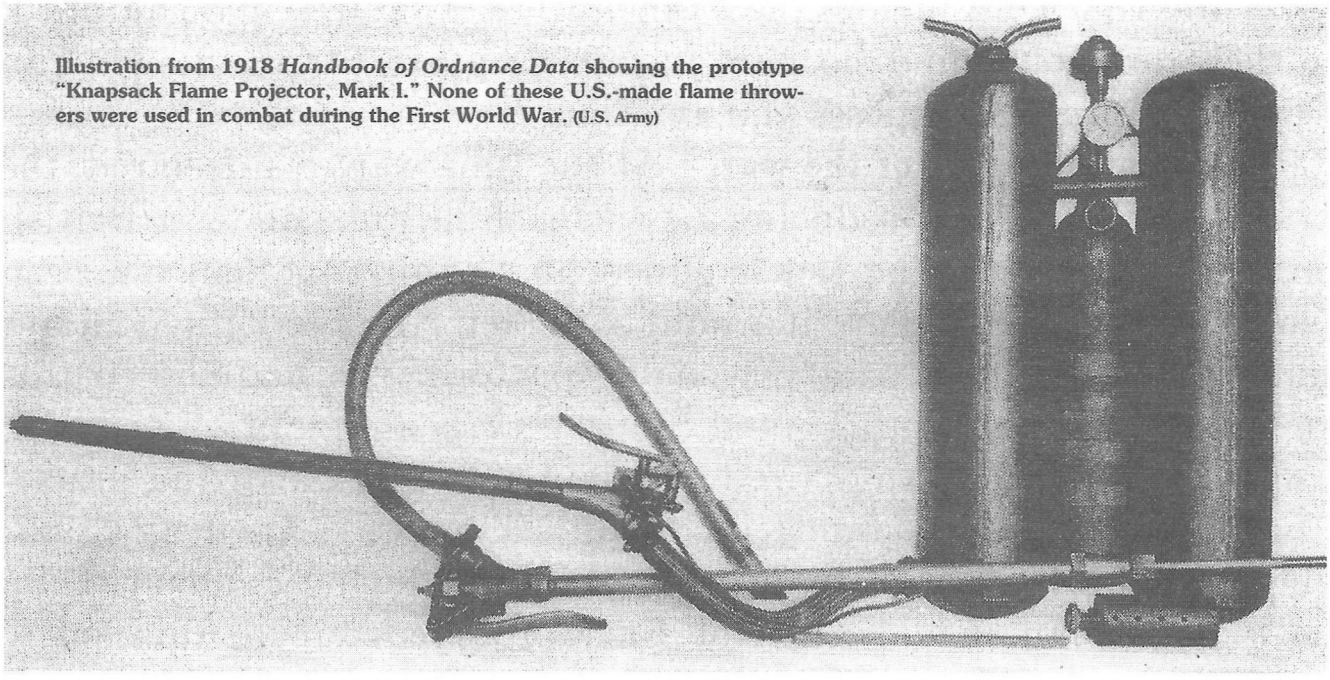


Illustration from 1918 *Handbook of Ordnance Data* showing the prototype "Knapsack Flame Projector, Mark I." None of these U.S.-made flame throwers were used in combat during the First World War. (U.S. Army)

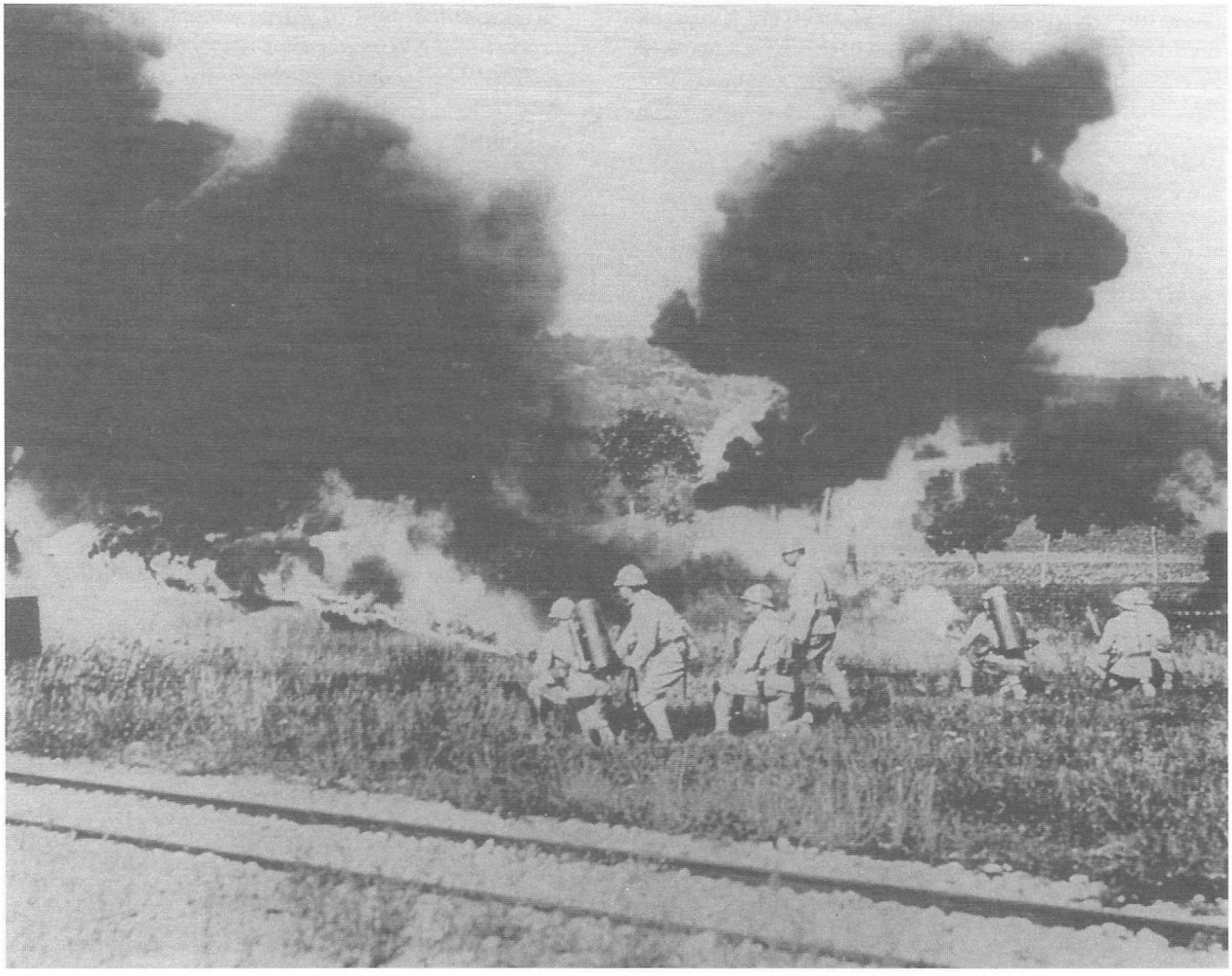


Photo of U.S. troops being trained by the French on the use of flame throwers. Even though they are wearing French uniforms and helmets, the caption on back of the original photograph identifies the troops as American. (National Archives)

deadlock but as a nonetheless valuable device. The Germans had first used a portable apparatus for projecting flaming oil in June 1915. The French soon developed a similar apparatus, and shortly thereafter Germans, French and British each developed small portable, as well as large, semifixed, projectors. The value of flame at the time was principally psychological — the fiery spurt of burning oil, the roar of the flame, and billowing clouds of black smoke had a terrifying effect on troops in the trenches. But the portable equipment was cumbersome, resupply was difficult, the field of fire was small, and the range rarely exceeded 30 yards. Furthermore, the operator of the portable apparatus was easily distinguished and highly vulnerable to small arms fire.

In spite of the technological problems encountered with the early flame throwers, they were viewed as useful, if flawed, weapons. As stated above, the employment of flame throwers was due more to its psychological value than its usefulness as a practical infantry weapon. The effect of the flame throwers could easily induce great fear into a front-line infantryman. The French were staunch proponents of infantry flame throwers. This is discussed by Laurence Stallings in *The Doughboys*:

The French set great store by their flame throwers in the taking of a town, and poilus showed up at the practice grounds with these lethal tanks strapped to their backs like fire extinguishers, the hose and nozzle section running under the armpit to the hands which directed a spray of flaming oil. (The Doughboys of the 28th Regiment knew of these devices — six weeks before, in the sleet at Seicheprey, some untried buddies had been burned to death by German Flamenwerfers which suddenly appeared on the parapets during a brisk enemy raid.) The French, desiring live Germans for interrogation, wanted flame throwers with the center battalion destined to move into the village itself; there was nothing like a little spurt of flaming oil down a cellar stairs to bring men out with their hands up.

When the United States entered the war, there were no flame throwers in inventory and none on the drawing boards. The responsibility for the development of flame throwers was given to the newly created Chemical Warfare Service (CWS) in 1917. A "Gas and Flame" Corps was organized and charged with the development and utilization of flame weapons, and in August of 1917, a "Gas and Flame Regiment" was authorized.

The various allied flame throwers were evaluated, and a project was instituted to develop an American flame thrower that utilized the best features of the allied flame throwers, particularly the French. There were several large flame projectors tested that were intended primarily for use in fixed positions. However, two types of flame projectors designed specifically for use by the infantry were developed. The first was a knapsack-type flame thrower that could be carried and used by one man. The weapon used nitrogen gas for propelling the combustible mixture of oil with other additives. This weapon was discussed in the Ordnance Department publication *History of Trench Warfare*:

The apparatus was arranged to be transported on a man's back, for the projection of liquid flame. ...when loaded (it) weighed about 23 kilograms. At the moment of use, the apparatus bearer places the apparatus on his shoulders, with the bottle to the right and the projector under his left arm pit. Fire is communicated to the stream by means of the lighted taper, or it is possible to ignite the liquid upon its leaving the projector, by using friction rockets, which are attached to the extreme end of the projector; always fastening two of them, so that the second may be ready in case the first is not effective.

Further refinement resulted in reducing the weight of the knapsack flame thrower from about 70 pounds to 50 pounds. The refined flame thrower was submitted for formal testing by the Ordnance Department and was designated as the "Knapsack flame projector, Mark I." The final designs were completed on December 9, 1918. However, the war had ended by this time, and further development and subsequent testing was dropped. It was not until the eve of the Second World War that renewed development of infantry flame throwers started. While an interesting and potentially valuable concept, no American-made flame throwers were used during WWI. Some Doughboys trained with French flame throwers and may have utilized some in combat. However, there have been no official government reports to confirm such use. The United States' military establishment was not overly enamored with flame throwers. A post-WWI Chemical Warfare Service report on the subject concluded:

Taken all in all, the flame thrower was one of the greatest failures among the many promising devices tried out on a large scale during the war.

In addition to the knapsack flame throwers, the U.S. Army experimented with several types of small flame projectors dubbed "flaming bayonets." These were small devices that attached to the front of the standard service rifle and could project a small spurt of

flame. The following description of the "flaming bayonets" is taken from the Ordnance Department publication *History of Trench Warfare*:

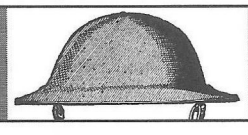
Experimental "Flaming Bayonet" mounted on M1917 rifle. The small, single-use flame thrower was mounted underneath the standard bayonet. The item was not used in combat during the war. (U.S. Army)

Flaming bayonet, liquid type, Mark I — the total weight charged, 7/8 pound. To be used as an accessory to the military rifle to afford a temporary advantage in bayonet fighting, by the projection of a spurt of flame from 5 feet to 15 feet in length. The shape and character of the flame obtained from the liquid type of flaming bayonet was not satisfactory and it was abandoned in favor of a cartridge type.

Flaming bayonet, cartridge type, Mark I — Weight loaded (5 shots), 5/8 pound. To be attached to the muzzle of the rifle in convenient position for operation when the rifle is held in position for bayonet fighting. Intended for the projection of a burst of flame from 5 feet to 15 feet long. This was deemed superior to the liquid type but was abandoned in favor of a flaming bayonet, cartridge type Mark III, which is a new model entirely enclosed and has a trigger which is operated by compressing the forefinger of the left hand.

The various "flaming bayonets" were tested with both the M1903 and M1917 rifles. The devices never progressed beyond the prototype stage before the war ended and further development was dropped. Unlike the knapsack flame thrower, which was resurrected and refined for use in the Second World War, the "flaming bayonet" was not revisited after the war. The concept was recognized as a marginal idea not worth expending time, effort and funds on refinement. The "flaming bayonet' is indicative of the fact that almost any idea possessing even a modicum of merit was considered if it might be of benefit to our troops. As we have seen, some of these ideas were useful and others were not. All of them, however, should be examined to obtain a clear picture of the United States infantry weapons of World War I.

Collector Notes



There are no known examples of the prototype U.S. flame throwers or "flaming bayonets" extant, so it is unlikely that a collector will ever encounter an example. A handful of French, British and German flame throwers survived the war, but most examples are in European military museums. The U.S. Army Chemical Warfare Service Museum at Edgewood Arsenal (part of Aberdeen Proving Ground) at one time had several WWI flame throwers including the U.S. prototype. No others are known to exist. Due to lack of available specimens, collector interest in WWI flame throwers is virtually nil due to the unavailability of specimens.

World War II flame throwers can be found from time to time on the market today but are far from common. Of course, such items would not be proper for a WWI collection. It is interesting to note that flame throwers are not considered "Destructive Devices" and can be owned (at least on the federal level) with no restrictions.

Any example of a WWI flame thrower, especially one of the American prototypes, would be an extremely rare and quite valuable item.

Appendical Tables

Table #1 — M1892 Krag Bayonet

Overall length:	16¼"
Blade length:	11¾"
Blade finish:	Bright (except for some blued blades the first year of production, 1894)
Manufacturer:	Springfield Armory
Production dates:	1894–1903
Production totals:	416,000 (estimated)
Issuance:	M1892, M1896 and M1898 U.S. Krag Rifles

Table #2 — M1905 Bayonet

Overall length:	20"
Blade length:	16"
Blade finish:	Bright from 1905 to 1917 Some blued in 1918 Parkerized after late 1918
Manufacturers:	Springfield Armory and Rock Island Arsenal
Production dates:	1905 to 1922 (modified version placed back into production during WWII)
Production totals:	1,571,798 (estimated)
Issuance:	M1903 Rifle

Table #3 — M1917 Bayonet

Overall length:	21.8"
Blade length:	17"
Blade finish:	Blued portion by hilt, phosphate finish on balance of blade
Manufacturers:	Winchester Repeating Arms Co. and Remington Arms Co.
Production dates:	1917–1917 (some Pattern 1914 bayonets made under British contract were also procured by the U.S. government)
Production totals:	1,961,538 M1917 bayonets plus 545,500 P14 bayonets acquired from the British
Issuance:	M1917 Rifle and M1897, M1912 and M1910 12 ga. "trench" shotguns

Table #4 — Mark I Canadian Ross Bayonet

Overall length:	14¾"
Blade length:	10⅛"
Blade finish:	Bright
Manufacturer:	Ross Rifle Co., Quebec, Canada
Acquisition date:	1917
Acquisition Total:	20,000 purchased by the U.S. government in 1917
Issuance:	M1910 Ross Rifle
Note:	Bayonets and scabbards purchased by the United States were stamped with a "flaming bomb" and "US" markings.

Table #5 — M1891 Mosin-Nagant Bayonet

Overall length:	19¾"
Blade length:	17"
Blade finish:	Blue
Manufacturer:	Remington Arms Co. (for U.S.-made bayonets)
Acquisition date:	1917
Acquisition total:	280,000 (estimated)
Issuance:	M1891 Mosin-Nagant Rifle
Note:	This bayonet was not issued with a scabbard.

Table #6 — M1886 French Berthier and Lebel Bayonet

Overall length:	25½" (some slight variance may be noted)
Blade length:	20⅜" (some variance may be noted)
Blade finish:	Bright
Manufacturers:	Various French arsenals
Acquisition dates:	1917–1918
Acquisition total:	Number is undetermined. Issued by the French Army to American troops serving under its command.
Issuance:	Lebel and Berthier Rifles

Table #7 — Pattern 1905 British Bayonet

Overall length:	21¾"
Blade length:	16⅞"
Blade finish:	Light phosphate finish (usually grayish-blue)
Manufacturers:	Various British contractors
Acquisition dates:	1917–1918
Acquisition total:	Number is undetermined. Issued by the British Army to American troops serving under its command.
Issuance:	Lee-Enfield SMLE Rifle

Table #8 — M1917/M1918 Trench Knife

Overall length:	14³⁄₁₆"
Blade length:	9"
Blade finish:	Blued
Manufacturers:	Landers, Frary & Clark, Oneida Community Ltd., American Cutlery Co., Henry Disston & Sons
Production dates:	1917–1918
Production total:	Undetermined
Note:	M1917 pattern had pyramid-shaped knobs on guard. M1918 pattern had the guard rolled over with five flanged projections on each side. Examples of both types dated "1917" and "1918" may be noted, thus some overlap in the model designations.
TO&E Requirements: (1918)	1,920 per Infantry Division, 480 per Infantry Regiment, 40 per Rifle Company

Table #9 — M1918 Mark I Trench Knife

Overall length:	11½"
Blade length:	6¾"
Blade finish:	Blue/black
Manufacturers:	(U.S.) Landers, Frary & Clark, Henry Disston & Sons and Oneida Community, Ltd. produced a few prototypes. The French-made knives were marked "Au Lion".
Production dates:	1918–1919
Production totals:	1,232,780 ordered under U.S. contracts, only 119,424 actually manufactured. Undetermined number of Mark I knives made in France under contract.
TO&E Requirements:	Same as for M1917/1918 Trench knives.

Table #10 — Collins No. 1005 Bolo Knife

Overall length:	20⅛"
Blade length:	15⅛"
Blade finish:	Bright
Manufacturer:	Collins & Co.
Production dates:	ca.1898–1919
Production total:	Undetermined
TO&E Requirements:	No specific allocation. Issued primarily to Engineering units.

Table #11 — M1904 Hospital Corps Bolo Knife

Overall length:	17⁵⁄₁₆"
Blade length:	12"
Blade finish:	Bright
Manufacturer:	Springfield Armory
Production dates:	1904–1915
Production total:	39,919
TO&E Requirements:	No specific allocation. Issued to U.S. Army medical units.

Table #12 — M1909 Bolo

Overall length:	19⁹⁄₁₆"
Blade length:	14"
Blade finish:	Bright
Manufacturers:	Springfield Armory and Fayette R. Plumb Co.
Production dates:	1909–1915 (Springfield Armory); 1917 (Plumb)
Production totals:	17,540 (Springfield); 58,000+ (Plumb)
TO&E Requirements:	No specific requirements, issued primarily to machine gun units.

Table #13 — M1910 Bolo

Overall length:	15"
Blade length:	10⅜"
Blade finish:	Bright prior to 1917. Blued blades beginning in 1917.
Manufacturer:	Springfield Armory
Production dates:	1910–1918
Production totals:	59,095
TO&E Requirements:	Same as M1909 Bolo

Table #14 — M1917/M1917CT Bolo

Overall length:	15"
Blade length:	10⅜"
Blade finish:	Parkerized
Manufacturers:	Fayette R. Plumb Co., American Cutlery Co., Bartlett Edge Tool Co.
Production dates:	1917–1918
Production totals:	Undetermined, but significantly greater than the number of M1910 produced by Springfield Armory.
TO&E Requirements:	Same as M1909 Bolo

Table #15 — M1915 Bolo-Bayonet

Overall length:	21"
Blade length:	15 13/16"
Blade Finish:	Bright
Manufacturer:	Springfield Armory
Production dates:	1915–1916
Production totals:	6,004
Issuance:	Experimental issue with M1903 rifle.

Table #16 — M1913 Saber

Overall length:	41½"
Blade length:	35⅓"
Blade finish:	Bright
Manufacturers:	Springfield Armory and Landers, Frary & Clark
Production dates:	1913–1918
Production totals:	Undetermined
Issuance:	Issued to cavalry units

Table # 17 — M1911 .45 Pistol

Operation:	Semiautomatic
Caliber:	.45 ACP
Feeding Mechanism:	7-round detachable box magazine
Weight:	2.43 pounds
Overall length:	8.62"
Barrel length:	5"
Muzzle velocity:	830 f.p.s.
Dates of production:	1911–1926
Manufacturers:	Colt, Springfield Armory, Remington-UMC (very limited number of pre-production prototypes made by North American Arms Co.)
Total WWI production:	643,755 Colt — approx. 596,000 Springfield Armory — 25,947 (FYs 1914–1917) Remington-UMC — 21,677 North American Arms — approx. 100
TO&E Requirements: (1918)	11,913 per Infantry Division, 1,200 per Infantry Regiment, 73 per Rifle Company

Table #18 — M1911 Assigned Serial Numbers

Year	Serial Number	Manufacturer
1912	1–17250	Colt
1913	17251–60400	Colt
1914	60401–72570	Colt
	72571–83855	Springfield Armory
	83856–102596	Colt
	102597–107596	Springfield Armory
1915	107597–113496	Colt
	113497–120566	Springfield Armory
	120567–125566	Colt
	125567–133186	Springfield Armory
1916	133187–137400	Colt
1917	137401–216986	Colt
1918	216987–594000	Colt
	1–13152	Remington-UMC
1919	13153–21676	Remington-UMC
	594001–629500	Colt
	629501–700000	Unknown

Table #19 — M1917 Smith & Wesson Revolver

Operation:	Double-action revolver
Caliber:	.45 ACP
Capacity:	6 rounds
Weight:	2¼ pounds
Overall length:	10.8"
Barrel length:	5½"
Muzzle velocity:	830 f.p.s.
Dates of production:	1917–1919
Total production:	153,311
TO&E Requirements:	Same as M1911 pistol

Table #20 — M1917 Colt Revolver

Operation:	Double-action revolver
Caliber:	.45 ACP
Capacity:	6 rounds
Weight:	2½ pounds
Overall length:	10.8"
Barrel length:	5½"
Muzzle velocity:	830 f.p.s.
Dates of production:	1917–1919
Total production:	151,700
TO&E Requirements:	Same as M1911 pistol

Table #21 — M1892–1905 Colt Revolvers

Operation:	Double-action revolver
Caliber:	.38 LC
Weight:	2 pounds, 2 ounces
Overall length:	11½"
Barrel length:	6"
Muzzle velocity:	750 f.p.s.
Dates of production during WWI:	1892–1910
Total issued:	40,000 (estimated)
Issuance:	Issued primarily to U.S. Army Signal Corps and engineering personnel, the National Guard and to some U.S. Navy units.

Table #22 — M1903 Rifle

Operation:	Manual bolt action
Caliber:	.30 (".30-06")
Feeding mechanism and capacity:	5-round internal magazine, loaded by 5-round charger or individual cartridges
Weight:	8.69 pounds
Overall length:	43½"
Barrel length:	24"
Muzzle velocity:	2,800 f.p.s.
Manufacturers:	Springfield Armory and Rock Island Arsenal
Dates of production:	1903–1928 (M1903A1 adopted in 1929)
World War I production totals:	(Does not include the approx. 600,000 rifles produced prior to 1917): Springfield Armory — 265,627 Rock Island Arsenal — 47,251
TO&E Requirements: (1918)	17,666 per Infantry Division, 3,200 per Infantry Regiment, 235 per Rifle Company

Table #23 — M1903 Mark I Rifle

Specifications same as for standard M1903 rifle Special parts included stock, trigger, sear and magazine cut-off.

Manufacturer:	Springfield Armory
Dates of production:	1918–1920
Production total:	Approx. 145,000
Serial number range:	1,000,000–1,200,000
Issuance:	Produced for use with M1918 Mark I Pedersen Device.

Table #24 — M1903 Rifle "Stripped for Air Service"

General specifications same as for standard M1903 rifle. Special parts include shortened stock, modified sights and 25-round extension magazine.

Manufacturer:	Springfield Armory
Date of production:	1918
Production total:	916
Serial number range:	857000–863000
Issuance:	Believed to have been intended solely for use in observation balloons.

Table #25 — M1903 Rifle with M1908 Warner & Swasey Musket Sight

General specifications same as for standard M1903 rifle.

Weight:	Approx. 11 pounds
Manufacturer:	Springfield Armory
Dates of production:	1908–1912
Production total:	2,075
Serial number range:	340000–500000
TO&E Requirements:	No stated requirements; Issued to infantry units.

Table #26 — M1903 Rifle with M1913 Warner & Swasey Musket Sight

General specifications same as for standard M1903 rifle.

Weight:	Approximately same as M1903 w/M1908 W&S sight
Manufacturer:	Springfield Armory
Dates of production:	1916–1918
Serial number range:	620000–1000000
Production total:	2,000 (estimated); 1,041 were produced in FY 1918
TO&E Requirements:	Same as M1903/M1908 W&S rifles

Table #27 — M1903 Rifle with Winchester A-5 Telescope

General specifications same as for standard M1903 rifle.

Weight:	Approx. 10 pounds
Manufacturer:	Most, if not all, were Springfield Armory production
Dates of production:	Scopes were mounted on essentially an "as-needed" basis
Serial number range:	No discernible range. Examples as low as the 468000 range to as high as the 600000 range have been noted.
Production total:	Unknown but very limited
Issuance:	Most rifles of this type were converted for Marine Corp rifle team use and later used as sniping weapons. A few hundred were procured by the U.S. Army during the WWI period as well. Many, but not all, of the USMC rifles had special "Mann type" tapered scope mounts.

Table #28 — M1917 Rifle

Operation:	Manual bolt action
Caliber:	.30 (".30-06")
Feeding mechanism and capacity:	Five- (or six) round internal magazine loaded by means of 5-round charger or individual cartridges.
Weight:	8.18 pounds
Overall length:	46.3"
Barrel length:	26"
Muzzle velocity:	2,930 f.p.s.
Manufacturers:	Winchester, Remington, Eddystone
Dates of production:	1917–1919
Production totals:	2,422,529 (Total produced as of 11/9/18 = 2,202,429)
TO&E Requirements:	Same as M1903 rifle

Table #29 — M1918 Sniper Rifle

Operation:	Manual bolt action
Caliber:	.30 (".30-06")
Feeding mechanism and capacity:	Same as M1917 rifle
Weight:	Approximately 11 pounds
Overall length:	Approximately same as M1917 rifle
Barrel length:	Approximately same as M1917 rifle
Muzzle velocity:	Approximately same as M1917 rifle
Manufacturer:	Winchester Repeating Arms Co.
Date of production:	1918
Production total:	59,742 ordered, 189 actually manufactured
Issuance:	Intended to be standardized U.S. Army sniper rifle but none were fielded.

Table #30 — U.S. Krag Rifle

Operation:	Manual bolt action
Caliber:	.30-40
Feeding mechanism and capacity:	Side-loaded magazine, 5-round capacity, loaded cartridges loaded individually.
Weight:	9.2 pounds
Overall length:	49.1"
Barrel length:	30"
Muzzle velocity:	2,000 f.p.s.
Manufacturer:	Springfield Armory
Dates of production:	1894–1903
Total issued in WWI:	Approx. 160,000
Issuance:	Issued as training rifle and supplementary service rifle for non-combatant use.

Table #31 — Mark II Ross Rifle

Operation:	Manual bolt action ("straight pull")
Caliber:	.303 British
Feeding mechanism and capacity:	5-round internal magazine loaded by charger.
Weight:	9 pounds, 14 ounces
Overall length:	50¼"
Barrel length:	30½"
Muzzle velocity:	2,600 f.p.s.
Manufacturer:	Ross Rifle Co. (Quebec, Canada)
Dates acquired:	Late 1917 into early 1918
Total acquired:	20,000
Issuance:	For training use and for State of New York.

Table #32 — M1891 Mosin-Nagant Rifle

Operation:	Manual bolt action
Caliber:	7.62mm Russian
Feeding mechanism and capacity:	5-round internal magazine loaded by charger
Weight:	9.63 pounds
Overall length:	51.3"
Barrel length:	31.6"
Muzzle velocity:	2,800 f.p.s.
Manufacturers (U.S.):	Remington Arms Co. and New England Westinghouse
Date acquired:	1917
Total acquired:	Approx. 280,000
Issuance:	For training use stateside and to arm the U.S. North Russian Expeditionary Force.

Table #33 — M1886 French Lebel Rifle

Operation:	Manual bolt action
Caliber:	8mm French
Feeding mechanism and capacity:	8-round tubular magazine (under barrel), manually loaded
Weight:	9.75 pounds
Overall length:	51.4"
Barrel length:	31½"
Muzzle velocity:	2,380 f.p.s.
Manufacturers:	Several French arsenals including Saint Etienne, Tulle and Chatellerault
Total acquired:	Very few procured by U.S. military
Issuance:	To American troops serving with French infantry units.

Table #34 — M1916 French Berthier Rifle

Operation:	Manual bolt action
Caliber:	8mm French
Feeding mechanism and capacity:	5-round internal magazine (earlier version 3-round capacity, clip-loaded)
Weight:	8.38 pounds
Overall length:	51.4"
Barrel length:	31.4"
Muzzle velocity:	2,380 f.p.s.
Manufacturers:	Saint Etienne and Chatellerault (France) and Remington (U.S.)
Total acquired:	See M1886 Lebel
Issuance:	See M1886 Lebel

Table #35 — British No. 1, Mark II SMLE

Operation:	Manual bolt action
Caliber:	.303 British
Feeding mechanism and capacity:	5-round internal magazine, charger loaded
Weight:	8.62 pounds
Overall length:	44½"
Barrel length:	25.2"
Muzzle velocity:	2,440 f.p.s.
Manufacturers:	Several British arsenals and contractors
Total acquired:	Very few procured by U.S.
Issuance:	Issued to U.S. troops attached to British units.

Table #36 — Cameron-Yaggi Trench Periscope Rifle

Operation:	Manual bolt action, operated by extension lever
Caliber:	.30 (".30-06")
Feeding mechanism and capacity:	25-round extension magazine, charger loaded
Weight:	Approximately 14.7 pounds
Overall length:	Same as M1903 rifle
Barrel length:	Same as M1903 rifle
Muzzle velocity:	Same as M1903 rifle
Manufacturer:	M1903 rifles used with Cameron-Yaggi attachment are believed to have been exclusively Springfield Armory manufacture.
Total acquired:	Undetermined. Estimated at perhaps a dozen.
Issuance:	Only tested experimentally, not fielded.

Table #37 – Winchester M1894 Carbine

Operation:	Lever action
Caliber:	.30-30 WCF
Feeding:	6-round tubular magazine (under barrel), manually loaded
Weight:	Approx. 6¼ pounds
Overall length:	38"
Barrel length:	20"
Manufacturer:	Winchester Repeating Arms Co.
Date acquired:	Late 1917, early 1918
Total acquired:	1,800
Issuance:	Primarily for issue to Signal Corps personnel stationed in the Northwest U.S.

Table #38 — Model 1907 Self Loading Rifle (SLR)

Operation: Semiautomatic
Caliber: .351
Feeding: 10-round detachable box magazine
Weight: Approx. 7½ pounds
Barrel length: 20"
Date acquired: 1916
Total acquired: 12
Issuance: To U.S. Army First Aero Squadron.

Table #39 — M1918 Pedersen Device

Operation: Semiautomatic
Caliber: .30 Pedersen
Feeding mechanism and capacity: 40-round detachable box magazine
Weight: Approx. 10 pounds (Installed in M1903 Mark I rifle)
Overall length: Installed, See M1903 Mark I rifle
Barrel length: Installed, See M1903 Mark I rifle
Muzzle velocity: 1,300 f.p.s.
Dates of production: Late 1918–1919
Total production: Approx. 65,000 (virtually all subsequently destroyed)
Issuance: Intended for general infantry issue. None fielded.

Table #40 — Model 1897 "Trench Gun"

Operation: Manually operated slide action
Gauge: 12
Feeding mechanism and capacity: 5-round tubular magazine (under barrel)
Weight: 8 pounds
Overall length: 39½"
Barrel length: 20"
Manufacturer: Winchester Repeating Arms Co.
Dates of production: Late 1917–1918
Total production: 25,000 (estimated) also several thousand M1897 plain-barrel riot guns
Issuance: Limited issue to infantry units and for guarding prisoners.

Table #41 — Model 10 "Trench Gun"

Operation: Manual slide action
Gauge: 12
Feeding mechanism and capacity: 5-round tubular magazine (under barrel)
Weight: Approx. 8½ pounds
Overall length: 41½"
Barrel length: 23"
Manufacturer: Remington Arms Co.
Dates of production: 1918
Total production: 3,500 plus 1,500 plain-barrel Model 10 riot guns
Issuance: See M1897 trench gun

Table #42 — Model 12 "Trench Gun"

Operation: Manual slide action
Gauge: 12
Feeding mechanism and capacity: 5-round tubular magazine (under barrel)
Weight: 8 pounds
Overall length: Approx. 39½"
Barrel length: 20"
Manufacturer: Winchester Repeating Arms Co.
Dates of production: 1918
Total production: Undetermined but quite small. A few plain-barrel Model 12 riot guns also procured.
Issuance: See M1897 trench gun

Table #43 — M1915 Chauchat Automatic Rifle

Operation: Selective-fire (fully automatic and semiautomatic)
Caliber: 8mm French
Feeding mechanism and capacity: 20-round detachable box magazine
Max. rate of fire: 300 rounds per minute
Weight: 19 pounds
Overall length: 45"
Barrel length: 17½"
Muzzle velocity: 2,375 f.p.s.
Manufacturer: Gladiator and St. Chamond
Dates of U.S. acquisition: 1917–1918
Total acquired by U.S.: 15,988
TO&E Requirements: (1918) 768 per Infantry Division, 192 per Infantry Regiment, 16 per Rifle Company

Table #44 — M1918 Chauchat Automatic Rifle

Operation:	Selective-fire
Caliber:	.30 (".30-06")
Feeding mechanism and capacity:	16-round detachable box magazine
Max. rate of fire:	Approx. 300 r.p.m.
Weight:	Approx. same as M1915 Chauchat
Overall length:	Approx. same as M1915 Chauchat
Barrel length:	Approx. same as M1915 Chauchat
Muzzle velocity:	Approx. 2,800 f.p.s.
Manufacturer:	Gladiator
Dates of acquisition:	1918
Total acquired by U.S.:	19,241 (very few actually issued)
TO&E Requirement:	See M1915 Chauchat Automatic Rifle

Table #45 — M1918 Browning Automatic Rifle (BAR)

Operation:	Selective-fire
Feeding mechanism and capacity:	20-round detachable box magazine
Max. rate of fire:	550 r.p.m.
Weight:	16 pounds
Overall length:	47"
Barrel length:	24"
Muzzle velocity:	2,800 f.p.s.
Manufacturers:	Winchester, Colt, Marlin-Rockwell
Dates of production:	1918–1919
Total produced:	102,125 (43,368 shipped to France during war) Winchester: 47,123 Marlin-Rockwell: 39,002 Colt: 16,000
TO&E Requirement:	See M1915 Chauchat Automatic Rifle

Table #46 — M1895 Machine Gun

Feeding mechanism:	Belt-fed
Cooling mechanism:	Air-cooled
Max. rate of fire:	450 r.p.m.
Caliber:	.30 (".30-06") previous models chambered for .30-40, .30-03 and 6mm USN
Weight:	Gun — Approx. 35 pounds Tripod — Approx. 56 pounds
Manufacturer:	Colt's Patent Firearms Manufacturing Co.
Issuance:	Issued for training use only during WWI.

Table #47 — M1914 Machine Gun

Feeding mechanism:	Belt-fed
Cooling mechanism:	Air-cooled
Max. rate of fire:	450 r.p.m.
Caliber:	.30 (".30-06")
Weight:	Gun — 35 pounds Tripod — 56 pounds
Manufacturer:	Marlin-Rockwell
Dates of production:	1914–1916
Issuance:	Training use by U.S. Army. Shipboard use by U.S. Navy.

Table #48 — Model 1904 Maxim Machine Gun

Feeding mechanism:	Belt-fed
Cooling mechanism:	Water-cooled
Caliber:	.30 (".30-06")
Max. rate of fire:	450 r.p.m.
Weight:	Gun — 74½" pounds (with full water jacket) Tripod — 78 pounds
Manufacturer:	Colt
Total produced:	287
Issuance:	Issued for training use only during WWI.

Table #49 — M1909 Benét-Mercie Machine Rifle

Feeding mechanism:	30-round metal strip
Cooling mechanism:	Air-cooled
Caliber:	.30 (".30-06")
Max. rate of fire:	400 r.p.m.
Weight:	Approx. 30 pounds
Overall length:	48½"
Barrel length:	25.1"
Muzzle velocity:	2,400 f.p.s.
Manufacturers:	Colt and Springfield Armory
Total produced:	670
Issuance:	Training use during WWI (some were deployed to France early in the war).

Table #50 — Lewis Light Machine Gun

Feeding mechanism:	47-round detachable "pan" magazine
Cooling mechanism:	Air-cooled
Caliber:	.30 (".30-06") and .303 British
Max. rate of fire:	600 r.p.m.
Weight:	(unloaded) 28¼ pounds
Overall length:	50½"
Barrel length:	26"
Muzzle velocity:	2,450 f.p.s. (.30 caliber)
Total procured:	M1917, caliber .30: U.S. Army — 2,500 U.S. Navy/USMC — 6,000 .303 caliber — 350
Issuance:	Training use by U.S. Army. Standard Marine Corps issue but did not see any significant combat use. Some .303 Lewis guns used by American troops assigned to British units.

Table #51 — Vickers Machine Gun

Feeding mechanism:	Belt-fed
Cooling mechanism:	Water-cooled
Caliber:	.30 (".30-06") U.S. M1915 .303 Mark I British model
Max. rate of fire:	Approx. 500 r.p.m.
Weight:	Gun — 42 pounds (with filled water jacket) Tripod — 56 pounds
Manufacturer:	Colt
Production dates:	1915–1918
Production totals:	12,125 (7,653 sent to France during war)
TO&E Requirements: (1918)	224 per Infantry Division 16 per Infantry Regiment 16 per Machine Gun Company

Table #52 — French M1914 Hotchkiss Machine Gun

Feeding mechanism:	24- or 30-round metal strips
Cooling mechanism:	Air-cooled
Caliber:	8mm French
Muzzle velocity:	2,380 f.p.s.
Max. rate of fire:	400 r.p.m.
Weight:	Gun — 54 pounds, 11 ounces (unloaded) Tripod — 54 pounds
Total acquired by U.S.:	5,255
Dates of acquisition:	1917–1918
TO&E requirements:	See M1915 Vickers machine gun

Table #53 — M1917 Browning Machine Gun

Feeding mechanism:	Belt-fed
Cooling mechanism:	Water-cooled
Caliber:	.30 (".30-06")
Max. rate of fire:	500 r.p.m.
Weight:	Gun — 34½ pounds (with filled water jacket) Tripod — 50 pounds
Manufacturer:	New-England Westinghouse, Remington, Colt
Date of production:	1918–1919
Total produced:	42,750 New-England Westinghouse — 30,150 Remington — 12,000 Colt — 600
TO&E Requirements:	See M1915 Vickers machine gun

Table #54 — 3" Stokes Trench Mortar

Weight (complete):	108 pounds
Length of barrel:	51"
Max. range:	800 yards
Weight of shell (HE):	11 pounds
Dates of production:	1915–1918 (Great Britain) 1918 (United States)
Production totals:	843 (U.S.). Some also acquired from the British.
TO&E Requirements: (1918)	36 per Infantry Division, 6 per Infantry Regiment, 6 per Headquarters Company

Table #55 — M1916 37mm Gun

Weight (complete):	170 pounds (gun and tripod) 340 pounds (w/wheels and axle)
Max. range:	2,600 yards (max. effective range approx. 1,500 yards)
Muzzle velocity:	1,320 f.p.s.
Weight of shell:	1.2 pounds
Dates of production:	(French) 1916–1918 (United States) 1918
Total acquired by U.S.:	620 purchased from French 2,598 ordered from U.S. manufacturers, only about 884 produced.
TO&E Requirements: (1918)	12 per Infantry Division, 3 per Infantry Regiment, 3 per Headquarters Company

Table #56 —
Collecting Aspects of Class III, Destructive Devices and Curio and Relic Weapons

Machine Guns and Destructive Devices

There is a great deal of confusion and mis-information regarding the legality of collecting many of the weapons discussed in the preceding pages. The following discussion will elaborate on the legal aspects of collecting machine guns and "Destructive Devices" as defined by the National Firearms Act (NFA) of 1934. It must be stressed that this information is not intended to constitute legal advice, and any questions should be referred to a licensed dealer in such weapons, the appropriate Federal agency (Bureau of Alcohol, Tobacco and Firearms) or an attorney knowledgeable in such matters. It must also be pointed out that a number of local, county and state governments have laws limiting or prohibiting the ownership and possession of such weapons and a person desiring to own one of these NFA weapons should familiarize himself with any applicable local and/or state laws. For the purposes of this discussion, there are two basic types of weapons that require special approval and licensing to legally own: Machine Guns and Destructive Devices.

The definition of a machine gun as stated in the National Firearms Act is:

The term machine gun means any weapon which shoots, is designed to shoot, or can be readily restored to shoot, automatically more than one shot, without manual reloading, by a single function of the trigger.

Defining a Destructive Device is a bit more involved. The NFA defines it as follows:
The term "Destructive Device" means:

(1) Any explosive, incendiary, or poison gas
  (a) bomb
  (b) grenade
  (c) rocket having a propellant charge of more than four ounces.
  (d) missile having an explosive or incendiary charge of more than one-quarter ounce.
  (e) mine
  (f) similar device

(2) Any type of weapon by whatever name known which will, or which may be readily converted to, expel a projectile by the action of an explosive or other propellant, the barrel or barrels of which have a bore more than one-half inch in diameter, except a shotgun or shotgun shell which the Secretary or his delegate finds is generally recognized as particularly suitable for sporting purposes.

The U.S. infantry weapons of World War I that fall into the Machine Gun category are obviously all of the automatic rifles and machine guns.

The weapons classified as Destructive Devices include mortars, mortar shells and grenades. Additionally, the 37mm M1916 gun is also classified as a Destructive Device since its bore is larger than .5 inches (.50 caliber). Grenades and mortar shells that have been rendered inert are not classified as Destructive Devices. Any questions regarding the status of a weapon should be referred to the BATF.

As stated, many people have erroneous ideas regarding the legality of collecting machine guns and destructive devices. Some people believe that ownership of such weapons is totally outlawed while others are of the opinion that such weapons can be sold at the corner pawn shop or local gun show with no restrictions. Both perceptions are incorrect. Federal law does allow for the transfer and possession of such weapons, but strict rules must be followed.

A person (not licensed as Dealer in machine guns or Destructive Devices) wishing to acquire a machine gun or destructive device should first ascertain that no local or state laws preclude ownership of such weapons. Federal approval for transfer will not be granted if such laws are violated. Assuming no local restrictions, the following is the general procedure that must be followed:

The first and most obvious step is to find the type of weapon desired for purchase. The weapon must already be properly registered with the Treasury Department in Washington, D.C. If a weapon is not so registered, it cannot be subsequently registered and legal ownership is not possible. For the sake of this discussion, we will assume that a potential buyer finds the desired weapon being offered for sale by an out-of-state licensed dealer. Many dealers attend some of the larger (and smaller) gun shows and regularly advertise in such publications as the *Shotgun News* and *Machine Gun News*. The dealer is contacted and a price is agreed upon.

Typically, the entire purchase price (or a previously agreed upon portion) is paid to the dealer to hold the weapon while the approval process is going on. Most dealers will refund all or most of the purchase price if the potential buyer is denied approval, but this should be agreed upon in writing prior to committing to a transaction. If the dealer selling the weapon is from out of state, the buyer must contact a dealer operating within his state and make arrangements for the out-of-

state dealer to first sell the desired weapon to the in-state dealer. The in-state dealer will then hold the weapon for the buyer until Federal approval has been obtained. Most in-state dealers will charge a modest fee for their services as long as the out-of-state dealer (the seller) is paid in full in advance.

With the desired weapon selected and paid for, the registration process begins. An Application for Tax Paid Transfer and Registration of Firearm (BATF Form 4), should be obtained from the dealer or the BATF and submitted in duplicate. The Form 4 lists the Transferee's (Buyer's) name and address and the Transferor's (Seller's) name and address. A description of the firearm or destructive device is given, including the name and address of the manufacturer, type of firearm or weapon (machine gun, destructive device, etc.), caliber, model, overall length, length of barrel and serial number. All weapons must have a serial number. Some destructive devices registered previously, particularly under the 1968 Amnesty, that did not originally have a serial number, were marked with a serial number assigned by the BATF. The transferee's federal firearms license number and BATF identification number (if any) and the transferor's federal firearms license number and BATF identification number (if any) are given. Both the transferee and transferor must sign and date the form. The applicant (transferee) must state his reason(s) for wishing to possess the firearm or device. Stating "For collecting purposes" is generally sufficient. A recent passport-type photograph must be affixed to each Form 4. Finally, a Chief Law Enforcement Officer must certify that he has no reason to believe that the applicant will use the weapon or device for other than lawful purposes, and that there are no state or local laws preventing such ownership. Typically, a Chief Law Enforcement Officer is defined as a Chief of Police, Sheriff, District Attorney or some similar authority. Some people have reported problems obtaining this statement either because the officer does not understand that he is not "approving" the application but merely certifying that he does not have the knowledge that the weapon will be used illegally or because the officer does not wish to have such weapons in his municipality or county. Legal action has sometimes resulted from such arbitrary refusals to sign the certification section of the form, but as a general rule, most such authorities will go along if approached in the proper manner.

Along with the completed (in duplicate) Form 4 a standard FBI FD-258 Fingerprint Form (in duplicate) should be completed. This must be done by a law enforcement agency (police department, sheriff's office, etc). The two Form 4s and fingerprint cards are then mailed along with a check in the amount of $200 to the proper BATF office. The BATF should be contacted to obtain the correct address. The $200 is for payment of the Federal transfer tax. This is a one-time tax and no subsequent taxes are due. If the owner should subsequently sell the weapon, the new transferee must again pay the tax as part of the transfer process.

The time for the approval process varies widely. A rough estimate is six months. Some approvals have been known to be much faster, while others take even longer. Upon approval, the dealer is notified, and one of the Form 4s with an attached and canceled $200 tax stamp is returned for delivery to the transferee. The dealer can then transfer the weapon to the approved buyer after the standard Form 4473 is filled out. The Form 4473 is the same form used to record the sale of any unregulated firearm. From that point on, the weapon is legally registered to the transferee as listed on the Form 4 and is legally considered the same as any other unregulated firearm if in the possession of the transferee. It is a wise idea to have the approved Form 4 (or a photocopy) on hand with the weapon at all times.

Prior to a change in the Federal law, many "dewats" (Deactivated War Trophies) were found for sale on the collector's market. Most of these dewats were machine guns and similar weapons that had their bolts welded or otherwise altered to prevent them from being fired. The law no longer provides for the registration of new dewats, although the ones currently registered may be transferred following the above procedure. The only difference is that the $200 transfer tax does not have to be paid on the transfer of a registered dewat. Dewats should not be confused with bazookas, mortars and other weapons which have been demilled. The demilling process renders the weapon utterly incapable of ever being reasonably restored back into firing condition. The actual demilling process may vary, but it typically involves boring a hole or holes in the tube or chamber portion of the weapon. The hole or holes must be at least as big as the bore diameter of the weapon. Also, the bore is permanently obstructed, usually by welding metal rods in the barrels. Dewats, on the other hand, could be (and often were when the law permitted) restored to firing condition with varying degrees of difficulty. Demilled weapons do not require any sort of Federal registration or regulation.

Curios and Relics

There is a Federal regulation which allows a person to apply for a Curio and Relics (C&R) collector's license. Forms to apply for such licenses are available from the BATF, and approval is generally granted,

assuming a person is not restricted from owning firearms (convicted felon, drug user, etc.). Licensed C&R collectors can obtain weapons classified as Curios and Relics through the mails and other similar channels without having to go through a licensed gun dealer.

The following definition of Curios and Relics is found in the Gun Control Act of 1968:

As set out in the Federal regulations (27 CRF 178.11), curios or relics include firearms which have special value to collectors. These firearms have special value because they possess some qualities not ordinarily associated with firearms intended for sporting use or as offensive or defensive weapons. To be recognized as curios or relics, firearms must: (1) Have been manufactured at least 50 years prior to the current date, but not including replicas thereof; or (2) Be certified by the curator of a municipal, State or Federal museum which exhibits firearms to be curios or relics of museum interest or; (3) Derive a substantial part of their monetary value from the fact that they are novel, rare, or bizarre, or from the fact of their association with some historical figure, period, or event.

The BATF has an extensive listing of weapons classified as Curios and Relics. Of particular interest to collectors of military weaponry, it should be noted that the BATF has expanded the definition of curios and relics to include:

(1) All original military bolt-action and semi-automatic rifles manufactured between 1899 and 1946.

(2) All properly marked and identified semi-automatic pistols and revolvers used by, or manufactured for, any military organization prior to 1946.

(3) All shotguns, properly marked and identified as having been manufactured for any military organization prior to 1946 and in their original military configuration only.

The above list covers all U.S. (and foreign) military rifles, pistols, carbines and shotguns of World War II and earlier periods. This is not to imply only licensed collectors can possess Curio and Relic weapons. Anyone who can legally own a firearm can possess such weapons but must go through a licensed dealer to purchase them through the mail or other similar means.

To slightly confuse the issue, some National Firearms Act (NFA) fully automatic weapons and Destructive Devices are also classified as Curios and Relics.

The BATF can provide a listing of the current NFA firearms classified as Curios and Relics including both U.S. and foreign weapons.

A C&R license holder must still go through the regular procedures for obtaining a NFA firearm, including filling out all forms and paying the $200 transfer tax. However, when the seller has obtained notification that the transfer has been approved, the NFA weapon can be sent to the C&R license holder even if he resides out of state. This eliminates the need to utilize the services of an in-state Class III dealer for such transactions.

It is a little-known fact that Federal regulations allow for the holder of a standard Class I Firearms License to obtain machine guns and destructive devices through interstate commerce (the mails, etc.) without having to utilize the services of a Class III dealer. However, the Class I dealer must go through the same channels and procedures, including the Form 4 and fingerprint cards as well as payment of the $200 tax. His license does not allow him to be a dealer for machine guns or destructive devices, but it does not prevent him from obtaining such weapons for his personal use if the standard approval and registration procedures are followed. Any questions should be referred to the appropriate sources.

The glamour and appeal of machine guns and destructive devices has resulted in a steadily appreciating collector's market for such weapons. Since it is not possible to register any additional weapons, the supply is finite, and the demand continues to remain strong. This, of course, has the effect of continually rising prices.

Some may disdain machine guns, mortars, bazookas and the like as unsuitable for collecting purposes. Nothing could be further from the truth. A World War I machine gun is every bit as legitimate for collecting purposes as a 1817 flintlock Common Rifle or a M1873 Trapdoor Springfield. Obviously, a person is not going to spend several thousands of dollars for an original M1928A1 Thompson submachine gun to stick up the local liquor store. The misuse of NFA registered weapons is absolutely nil.

The collecting of World War I U.S. machine guns and destructive devices is an extremely interesting and rewarding hobby, and anyone who has a desire to collect such weapons would be well advised to do so. The mechanics of transfer and registration are really not that onerous, and the rewards are well worth the modest amount of effort involved.

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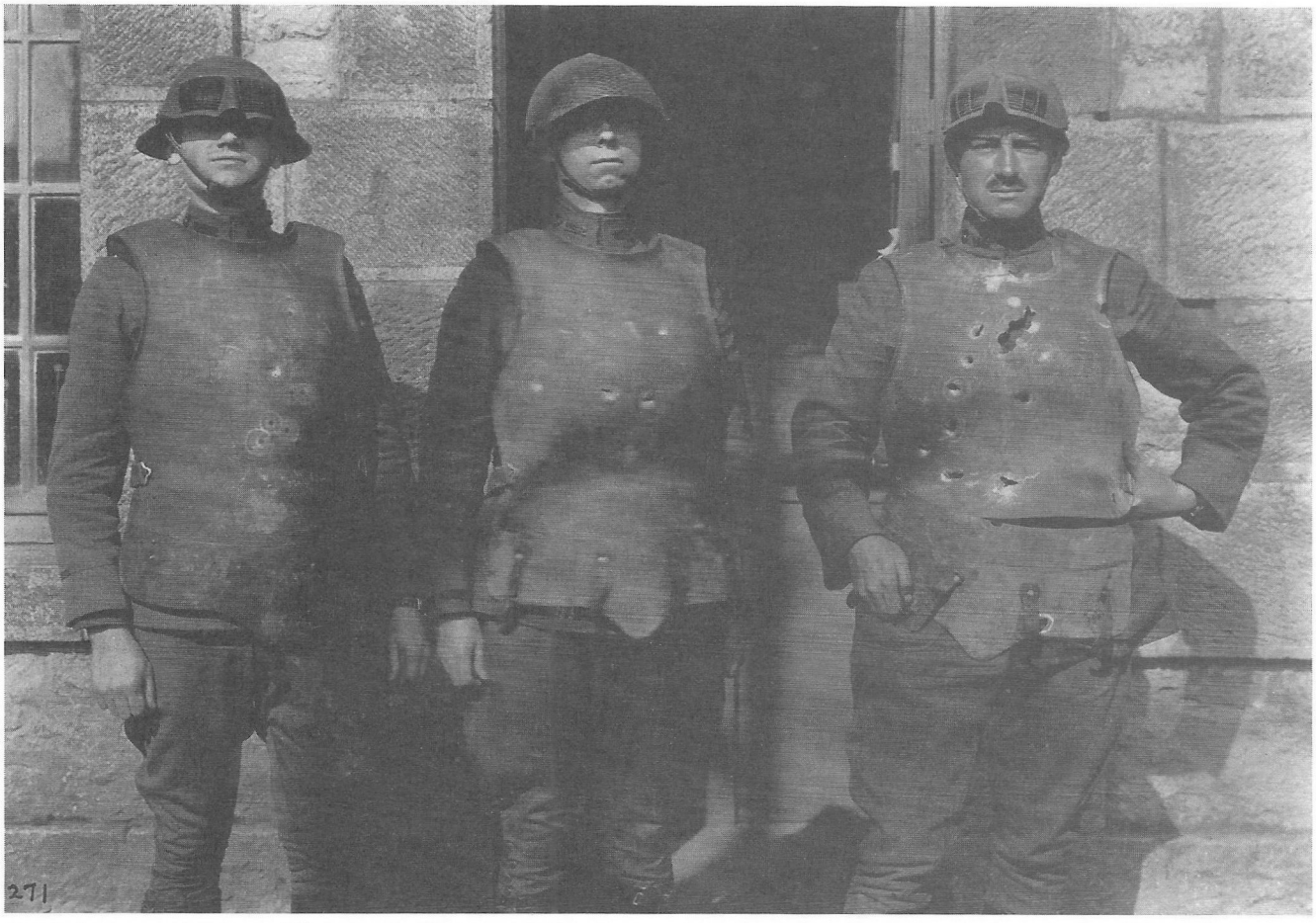

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